

DIESEL PROGRESS

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR



FIVE DOLLARS PER YEAR

MAY, 1952

FIFTY CENTS PER COPY

Use the lube that SAVES THE FUEL

...TEXACO URSA OIL

★ Operating records from all parts of the country show *truly low* fuel consumption for Diesel, gas and dual-fuel engines lubricated with *Texaco Ursa Oil*. And *truly low* maintenance costs, too.

Texaco Ursa Oil's "built in" resistance to oxidation and ability to stand up under extreme heat and pressure keep engines running clean. Rings stay free, ports stay clear, valves work properly — unhampered by harmful formations of carbon, sludge and gum. Results: better compression and combustion for lower fuel consumption; less wear and smoother operation for lower maintenance costs.

Leading engine builders approve *Texaco Ursa Oils*, and there is a complete line to assure top performance from every type and size of Diesel engine. That's why—

For over 15 years, more stationary Diesel b.p. in the U.S. has been lubricated with Texaco than with any other brand.

You'll find it worth your while to talk to a Texaco Lubrication Engineer. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

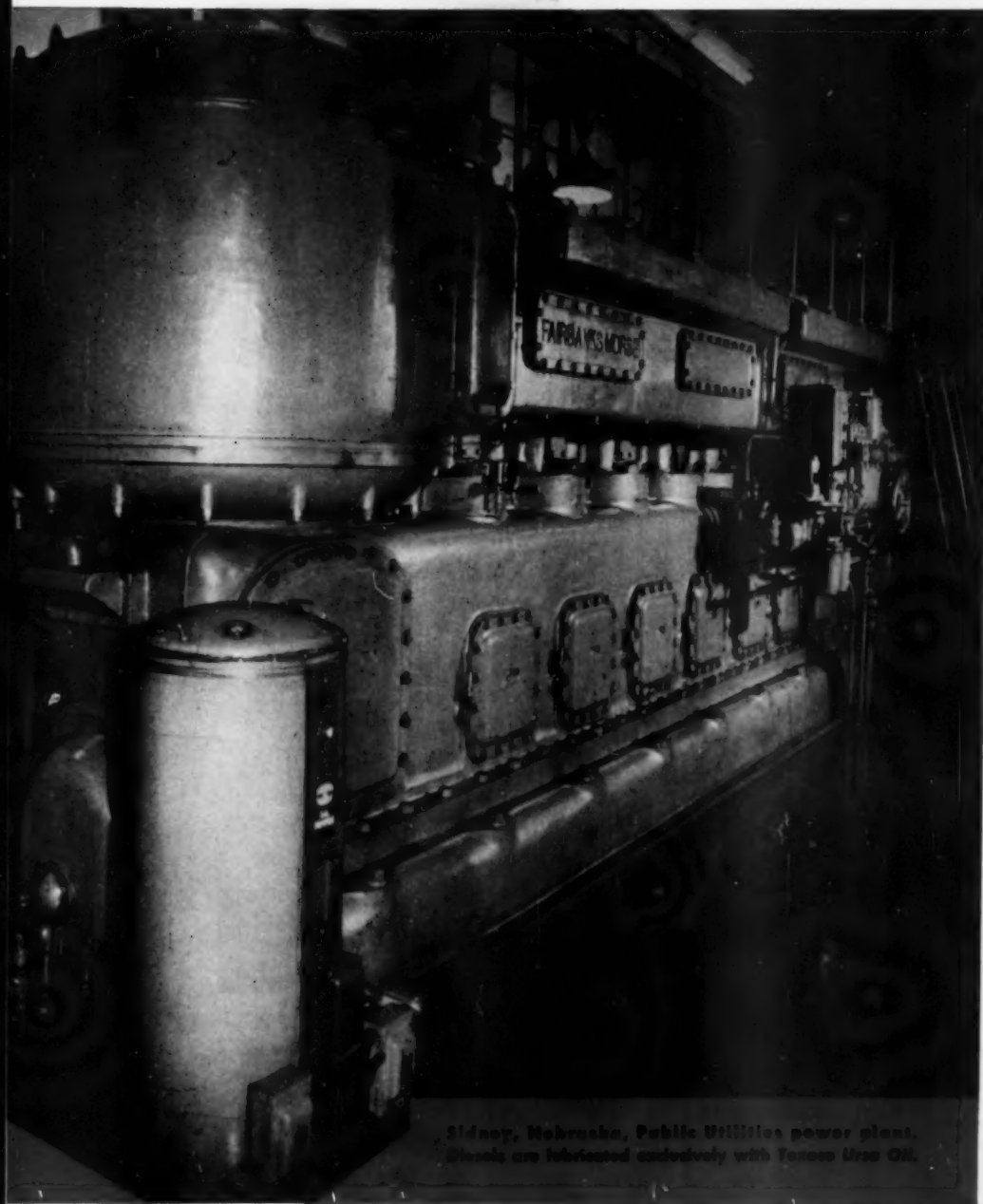
☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN . . . TEXACO
STAR THEATER
starring MILTON BERLE
on television
every Tuesday night.
See newspaper for
time and station.



TEXACO



Sidney, Nebraska, Public Utilities power plant.
Engines are lubricated exclusively with Tenneco Ursa Oil.

URSA OILS FOR ALL DIESEL, GAS
AND DUAL-FUEL ENGINES

Faithfully yours
50
YEARS
for Fifty Years

Rugged Reliable Snubbers*

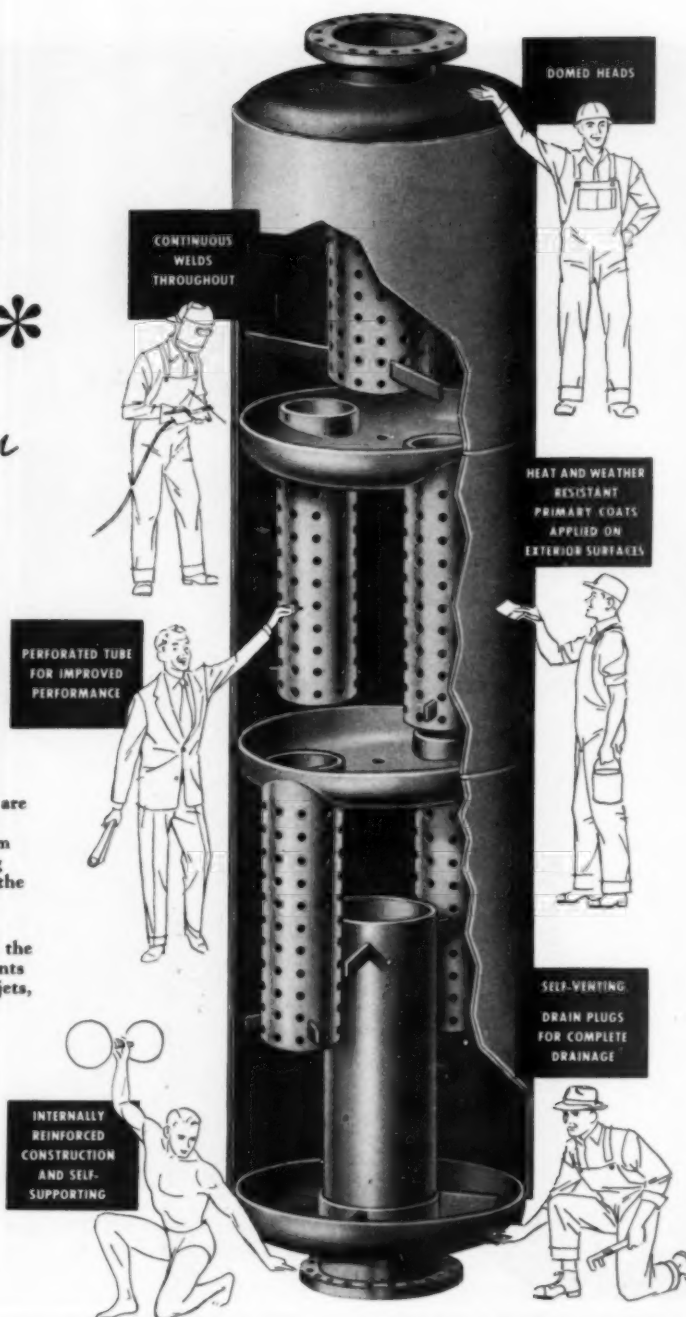
*for quiet operation
of engines
and compressors*

Burgess-Manning Snubbers are soundly engineered, carefully fabricated by craftsmen from quality materials. Burgess-Manning Snubbers are built to meet the rugged operating conditions encountered in the field.

Snubbers are available to meet the exacting noise reduction requirements of your Diesel and gas engines, jets, turbines, blowers, compressors, and vacuum pumps.



Choice of Snubbers from industrial silencing level to critical installations such as hospitals, hotels, office buildings, and residential areas.



BURGESS-MANNING COMPANY

Dallas, Texas

749-A East Park Ave., LIBERTYVILLE, ILLINOIS

Chicago, Illinois

Strip Act Goes Underground



TOPS FOR TIGHT PLACES. This compact International TD-9 and loader combination is a natural for work in close quarters.

International TD-9 loads 600 tons of shot rock daily for Missouri quarry

Two years ago, Rock Acres Development Company, Independence, Missouri, was a stripping operation.

Today, they're quarrying underground, with a yearly production of 120,000 tons of agricultural limestone and road stone.

Star performer is an International TD-9, equipped with a dozer shovel. In this underground operation, the TD-9 loads as high as 600 tons of shot rock daily . . . works an area 600 feet wide and 700 feet back.

"Our TD-9 is a real money maker," says Superintendent Norman Searcy. "Maneuverability is the reason we can load so much—and the upkeep costs are very low."

Above ground or below, International power is always a money-maker in quarry operations. Your International Industrial Distributor has facts and figures to back up this statement with actual performance records. See him for the real low-down on International "power that pays."

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL



POWER
THAT
PAYS

Again...proved BEST!

Over-all engine wear REDUCED 78%

Ring wear REDUCED 33%

in over-the-road tests with

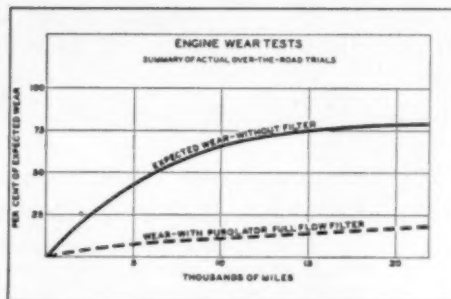
PUROLATOR

FULL-FLOW

MICRONIC FILTERS

In test after test, America's leading automotive and engine manufacturers are proving that Purolator oil filters are the best!

The figures you see above are from engineering records compiled by one of the world's largest makers of passenger cars and trucks. They are the results of gruelling *actual-service* tests made to compare the performance of various makes and types of lube oil filters. And, like so many other important ones, this manufacturer found that Purolator*, and only Purolator, oil filters gave them the engine-saving performance they were seeking. They found that Purolator Full-Flow filtration was better by far than any partial flow system . . . that the Purolator Micronic* Filter element gave finer filtration, with longer life, at lower pressures than any other tested.



There are sound reasons for the Purolator Micronic Filter Element's outstanding superiority! It is the *only* element capable of delivering full-flow rates during its entire service life, with dependable filtration down to submicrons (.0000039 in.!) It has ten times the effective filtering area of old-style filters.

If you are a maker or user of internal

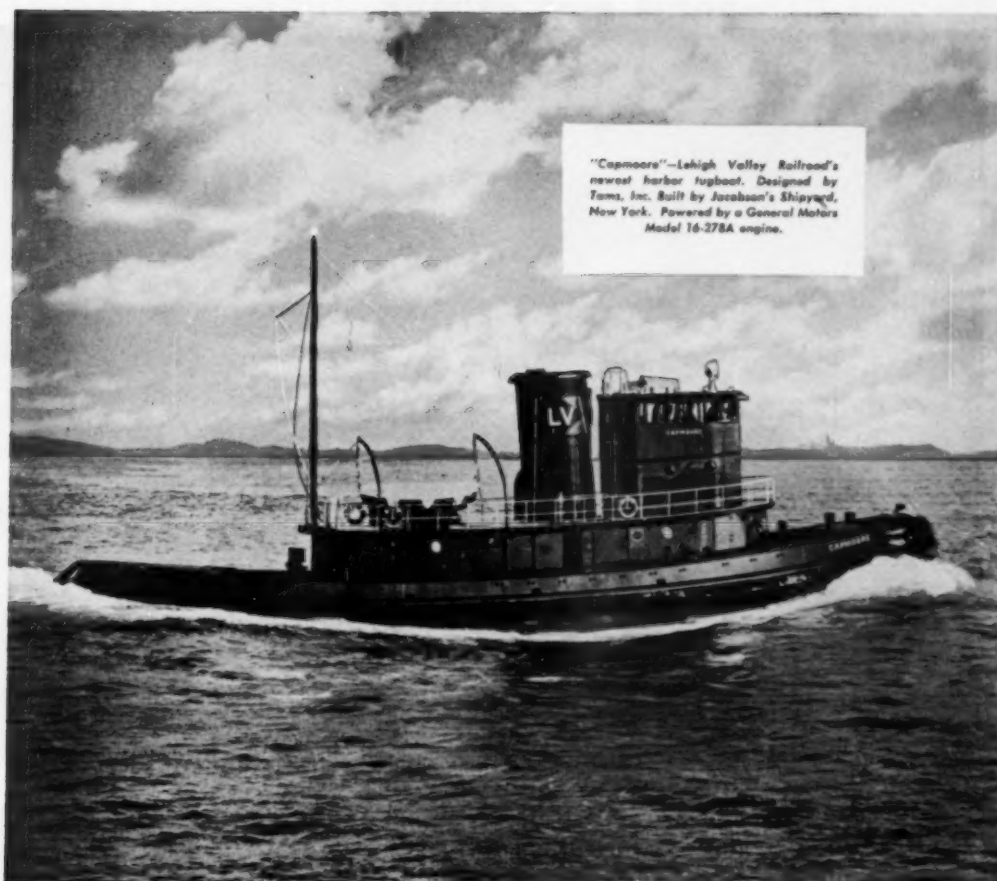
combustion engines, you are invited to test and compare Purolator performance for yourself. Our Engineering Department will gladly co-operate in helping you prove to your own satisfaction that there is no other oil filter capable of giving you better engine protection than Purolator. Simply write, telling us what equipment you are using. *Reg. U. S. Pat. Off.

PUROLATOR PRODUCTS, INC.
Rahway, New Jersey and Toronto, Ontario, Canada
Factory Branch Offices:
Chicago, Detroit, Los Angeles

PUROLATOR

MICRONIC OIL FILTER

"FIRST IN THE FIELD OF FILTERING"



"Capmoore"—Lehigh Valley Railroad's newest harbor tugboat. Designed by Tams, Inc. Built by Jacobson's Shipyard, New York. Powered by a General Motors Model 16-278A engine.

**Now it's
5
for Lehigh**

The "Capmoore" is the fifth General Motors Diesel-Electric powered tug to join the fleet of Lehigh Valley Railroad. Wherever towing service requires smooth, dependable, efficient power, GM Diesel-Electric Drive is first choice today.

No Substitute For Diesel-Electric Drive

Cleveland Diesel Engine Division

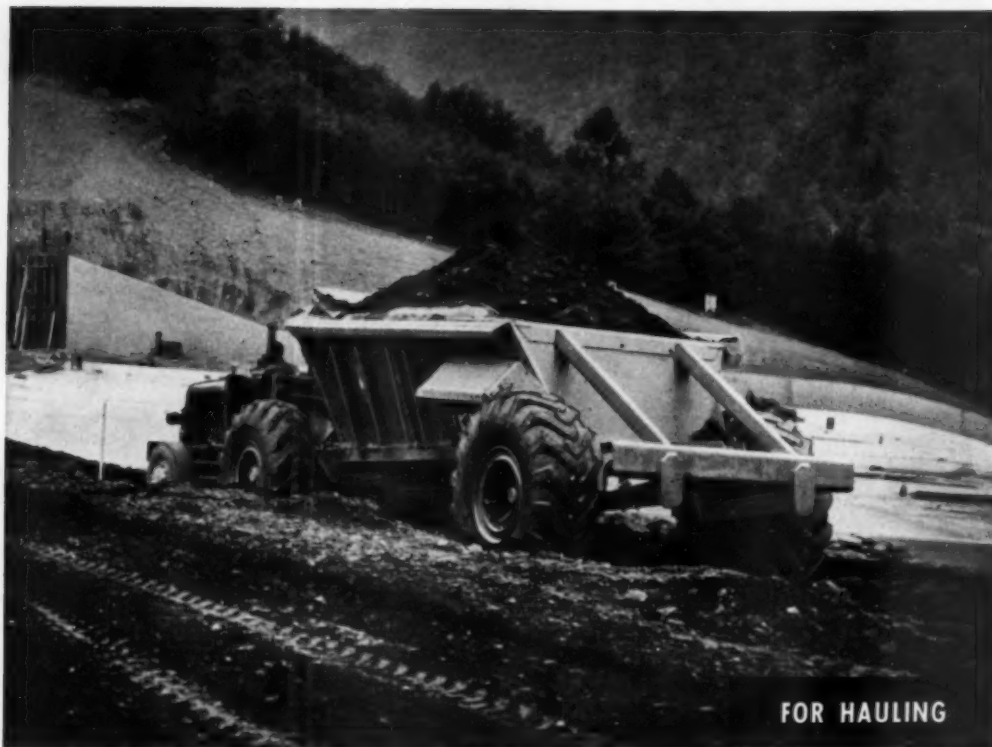
GENERAL MOTORS • CLEVELAND 11, OHIO



SALES AND SERVICE OFFICES

ENGINES FROM 150 TO 2000 H. P.

Cambridge, Mass. • Jacksonville, Fla. • Miami, Fla. • Montreal, P. Q. • New Orleans, La. • New York, N. Y. • Norfolk, Va. • Orange, Texas
San Francisco, Calif. • Seattle, Wash. • St. Louis, Mo. • Tampa, Fla. • Toronto, Ont. • Vancouver, B. C. • Washington, D. C. • Wilmington, Calif.



FOR HAULING

THIS IS THE DIESEL

for any job from 32 H.P. up

General Motors builds Diesel engines that do jobs no Diesel ever did before. We've made them sturdy, more powerful, more compact. And along with that, we've given them all the things you want in a work engine.

The GM Diesel starts quickly on Diesel fuel. It delivers a smooth, steady flow of power. It gets more work done in less time because it is faster-accelerating—reacts to varying loads with a snap and responsiveness other engines of its size can't match.

This power-packed 2-cycle Diesel fits in about the same space as gasoline engines of comparable horsepower—and provides fuel and maintenance savings of 40% to 70%.

You'll find this versatile Diesel available in more than 750 different kinds of equipment built by over 150 manufacturers. Write us or see your GM Diesel distributor for the complete list.

DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines . . . 32 to 275 H.P. Multiple Units . . . Up to 800 H.P.

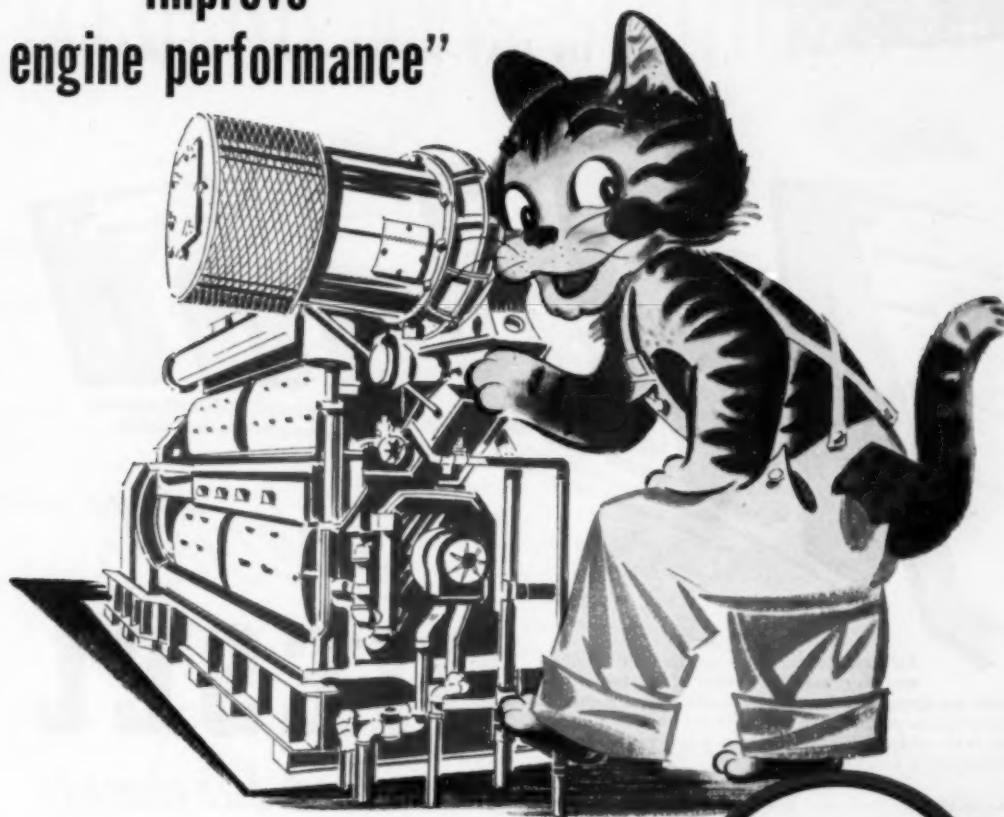


FOR HOISTING



FOR HARVESTING

**"Tycol Diesel Oils assure free rings
improve
engine performance"**



Certainly! Tycol Diesel Lubricants resist sludging, gumming and carbonization. They are made from specially refined, high quality bases, and offer outstanding stability. They have high resistance to heat and decomposition.

They help diesels operate continuously . . . with maximum efficiency . . . and lowest maintenance costs.

There is a Tycol Diesel Oil scientifically engineered for every Diesel application — from high-speed units for industrial, railway and marine uses where a heavy-duty or detergent oil is necessary to low speed Diesels where a non-additive lubricant can be used.

Want to learn more about these fine oils — engineered to do the job better, at lower cost? Call or write your nearest Tide Water Associated office today.

SEND FOR A FREE COPY OF "TIDE WATER ASSOCIATED LUBRICANIA"



Boston • Charlotte, N. C. • Pittsburgh
Philadelphia • Chicago • Detroit
Tulsa • Cleveland • San Francisco





job tested

IN DAY-AFTER-DAY OPERATION

Ashland

special

DIESEL

fuels and lubricants

Ashland sales engineers are continually working with operators of all types of diesel equipment to improve operation and reduce maintenance costs. Often called in for trouble-shooting, their wide experience has proven valuable in arriving at a solution.

Where proper fuels are the problem, Ashland has the answer. Ashland sales engineers can prescribe the type and grade proved best for every engine and operating condition. Our refinery blending processes can supply most any combination of fuel components.

If it's proper lubrication, Ashland again has the answer. The Ashland group of refineries produces a large selection of lubri-

cants. Crude oil supplies come from many sources, including the finest Pennsylvania and mid-continent crudes. Our lubricating chemists are continually improving and developing new formulas based on the experience of one of the oldest and best-known lubricating plants in the industry. Call on our sales engineering staff any time. Give them the facts and they'll come up with the answer.



...complete line of lubricants for diesel equipment

ASHLAND OIL & REFINING COMPANY

ASHLAND, KENTUCKY

SUPPLY TERMINALS: Ashland, Ky. — Buffalo, N. Y. — Canton, O. — Cincinnati, O. — Cleveland, O. — Erie, Pa. — Evansville, Ind. — Findlay, O. — Follansbee, W. Va. — Freedom, Pa. — Kenova, W. Va. — Kobuta, Pa. — Louisville, Ky. — Marietta, O. — Nashville, Tenn. — Niles, O. — Paducah, Ky. — Pittsburgh, Pa. — St. Elmo, Ill. — St. Louis, Mo. — Toledo, O.

Cummins® Diesels

do so many jobs—so much better



Shovels, cranes,
industrial locomotives



Drilling rigs, centrifugal
pumps, generator sets



Buses and
on-highway trucks



Earthmovers, logging
yarders and loaders



Off-highway trucks,
crawler tractors



Work boats,
pleasure craft

**...because they're
custom-built to fit the job**

Lightweight, high-speed Diesels (50-550 hp) for these and many other uses

...because they're

***BUILT
NOT
ONCE
BUT
TWICE***

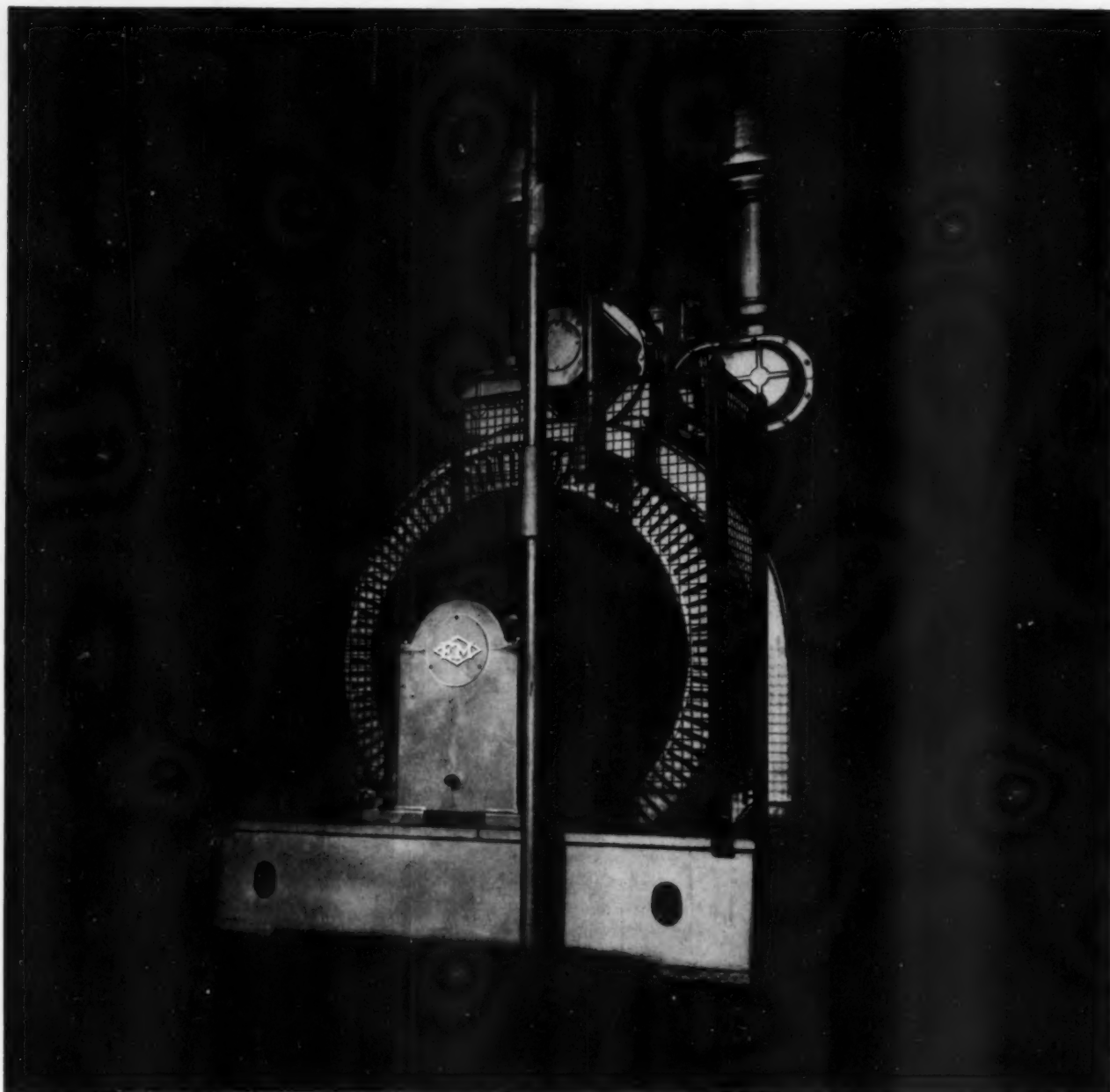
Rugged, lightweight, high-speed Cummins Diesels are at work everywhere. Each engine is built twice. It's assembled, run-in tested, disassembled and inspected, then reassembled and tested again. This extra care in building, plus Cummins exclusive fuel system and an efficient and expanding service and parts organization, means minimum "down time", more power and profits for the user. See your Cummins dealer.



TRADEMARK REG. U. S. PAT. OFF.

**Diesel power by
CUMMINS**

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA
Export: Cummins Diesel Export Corporation • Columbus, Indiana, U.S.A. • Cable: Cumdiex



2100-TPA-2114

Light Sleeper...

How quickly do you wake up?

In case normal line power should fail at Northwestern Bell Telephone Company in Minneapolis, the sensitive standby power plant above pops awake in seconds, starts delivering critical emergency power.

This ever-alert protection is supplied by an E-M, 1250 KVA, 720 rpm Synchronous Generator driven by a diesel engine. A system of relays starts the unit instantly if line power is interrupted... all the calls from Northwestern Bell's 93,000 downtown telephones can then be carried on by standby power.

You'll find hundreds of other E-M Standby Generators ready for action in exacting emergency situations all over the world. Each E-M Generator has been individually tailored to specific requirements. These accomplishments have made E-M engineers specialists in solving original design problems.

If you have no emergency protection, or feel your present equipment may be inadequate, ask your nearest E-M sales engineer for his suggestions. Also, write for Issue No. 35 of the E-M *Synchronizer*, illustrating the full line of E-M Generators. It has a special section on emergency power.

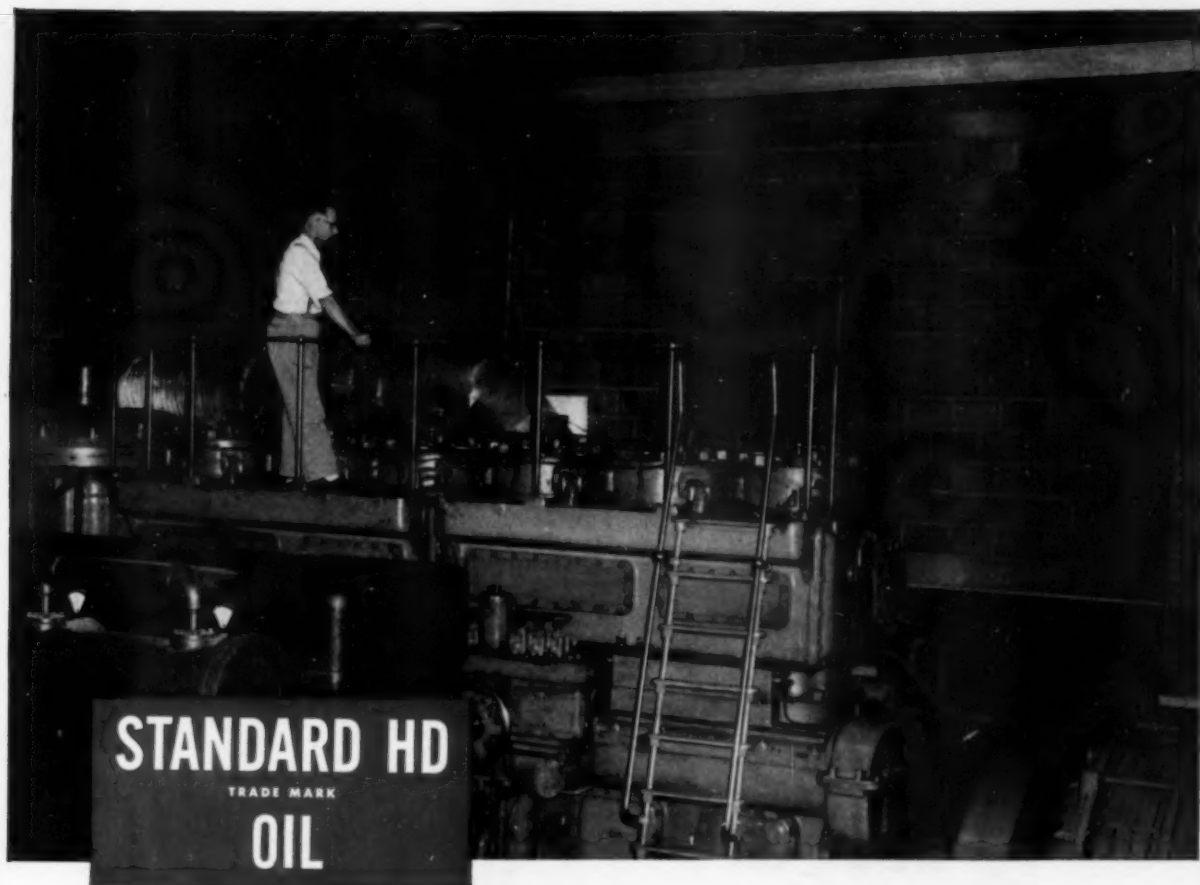
ELECTRIC MACHINERY MFG. CO.
MINNEAPOLIS 13, MINNESOTA



A complete line of AC generators for standby sets

DIESEL PROGRESS

MAY



STANDARD HD
TRADE MARK
OIL

Doubles time between overhauls

• In the case of this 1028 HP diesel serving a midwestern municipal power station, excessive operating and maintenance costs were a serious problem . . . until a Standard Oil lubrication specialist recommended changing to STANDARD HD Oil and STANDARD Diesel Fuel.

Here's the situation today, in comparison with the results which plant operators were getting with a conventional lubricant:

Ring sticking, ring breakage, and car-

bon deposits have been eliminated.

Ring replacements have been reduced from 80 to 18 per year. Cylinder wear has been cut from .003" per 1000 hours to a maximum of .003" per 5000 hours.

Time between overhauls has been extended from 2500 hours to 6000 hours and longer.

Lubricant consumption, formerly averaging one gallon per 1192 KW generated, now averages one gallon per 1535 KW generated. Fuel con-

sumption, which had averaged 12.28 KW per gallon, now averages 13.50 KW per gallon.

A Standard Oil lubrication specialist can help you develop a similar "before and after" situation in the operation of your own diesels. For his services, and his recommendations, simply call the Standard Oil Company office in your own area. Or write:

Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.

STANDARD OIL COMPANY



(Indiana)

Thrifty Babies!

**This much fuel oil
in a General Motors
Diesel locomotive will
haul a 40-ton loaded
freight car**



one mile!

Oil-burning steam locomotives consume five times as much fuel on the same haul and take 20% longer to get there.



TO CONSERVE FUEL AMERICA NEEDS MORE DIESELS!

**ELECTRO-MOTIVE DIVISION
GENERAL MOTORS**

LA GRANGE, ILLINOIS—In Canada: GENERAL MOTORS DIESEL LTD., LONDON, ONTARIO

If you are interested in the conservation of fuel by Diesel locomotives, write Electro-Motive Division for a recent study.

NOW — *even cleaner engines*
— *even lower maintenance costs*

with the new, improved

GULF DIESELMOTIVE OIL



Now—because of greatly improved detergent-dispersant characteristics, Gulf Dieselmotive Oil provides even better protection against harmful deposits in railway, marine, and stationary Diesels. It's ideal for engines with high power ratings and for use with fuels containing cracked materials or sulphur — keeps oil control and compression rings cleaner and freer.

In all other respects, Gulf Dieselmotive Oil retains the same superiority demonstrated in millions of miles and thousands of hours of service. Made from 100% solvent-refined oil, it does not form harmful metal-like deposits on piston crowns, especially important where the same oil is in service for a long period of time.

Gulf Dieselmotive Oil also has outstanding resistance to oxidation and the formation of crank-

case sludge. Of course it's nonfoaming and non-corrosive to silver bearings.

These advantages add up to cleaner engines, reduced cylinder wear, and lower maintenance costs.

For further information, write, wire, or phone your nearest Gulf office.

Gulf Oil Corporation • Gulf Refining Company
Pittsburgh 30, Pennsylvania





TODAY...

We're all in the steel business!



FOR EACH OF US TO GET MORE STEEL... AND PRODUCTS MADE OF STEEL...
WE'VE GOT TO PROVIDE MORE SCRAP TO MAKE THE STEEL.

Half the melting stock used in the steel mill or iron foundry consists of iron and steel scrap. In normal times, enough scrap is produced by the mills, foundries, railroads, fabricators and scrap dealers to fill the need.

But now the mills have stepped up capacity to meet the greatly increased military and civilian demands for steel. And that increased capacity has outstepped the supply of scrap.

That is why we are calling on plants in both metal-working and NON-METAL-WORKING industries to provide the needed scrap NOW.

You have the heavy scrap needed to make more steel

Enough obsolete machinery, equipment and parts are being carried as useless inventory to give a big push to

This advertisement is a contribution, in the national interest, by

the production of steel. Surveys have proved this.

The trick is to get that old steel into the hands of the steel producers.

We're putting that job up to you.

To help maintain steel production... provide more steel for the equipment you want... turn in your idle iron and steel to your local scrap dealer.

What you can do to help maintain steel production

1. Appoint one top official in your plant to take full responsibility for surveying the plant and getting out the scrap.
2. Consult with your local Scrap Mobilization Committee about its program to help out in the scrap crisis. For chairman's name, check with your Chamber of Commerce, or the nearest

office of the National Production Authority, Department of Commerce.

3. Call in your local scrap dealer to help you work out a practical scrapping program. Non-ferrous scrap is needed, too.

4. Write for free booklet, "Top Management: Your Program For Emergency Scrap Recovery", addressing Advertising Council, 25 W. 45 St., New York 19, N. Y.

R. D. T. T. T. T.

Editor-DIESEL PROGRESS



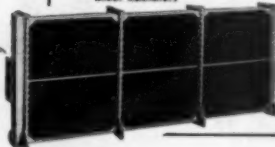
YOUNG *All the Way!*

DIESEL LOCOMOTIVE COOLING



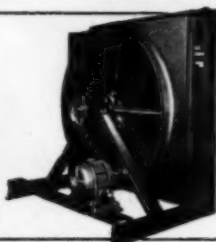
Removable and Fixed Tube Bundle, Shell and Tube Heat Exchangers

"MONO-WELD" Heavy-Duty Steel Radiators



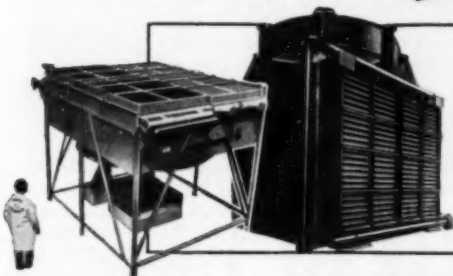
The combination of Young "MONO-WELD" radiators and heat exchangers offers heat transfer equipment that combines to provide proper, efficient cooling. "MONO-WELD" construction insures long life with steel single unit tanks, steel side members, and proper core selection. Young heat exchangers give maximum heat transfer per unit volume, with minimum weight.

GAS, GASOLINE, DIESEL ENGINE FLUID COOLING



Young "FULL FLOW" and "STANDARD SERIES" Jacket Water Coolers

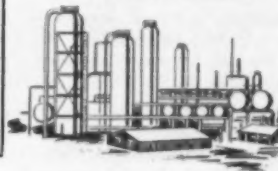
Young units offer a complete variety of cooling surfaces, compact, rugged design, welded steel construction. Vertical water flow, steel channel side members, steel side supports for cores, press-formed heavyweight non-ferrous headers, complete accessories, versatility of components to meet all requirements.



Young "HC" (left) and "VAD" Vertical Air Discharge Units

These units offer vertical air discharge—not affected by wind direction—efficient operation, full size plenum chambers, efficient air handling equipment, simple rugged structure of frame and metal work, proper heat transfer surface for any application required.

GAS, GASOLINE, DIESEL ENGINE FLUID COOLING AND CONDENSING



Requirements for jacket water, lube oil, torque converter or other specialized cooling may be met with the wide range of radiators and other products manufactured by Young. To fit specific requirements, use of proper materials, surfaces and accessories provide maximum heat transfer per unit volume of available space with minimum weight.

POWER PLANT AND SPECIALIZED COOLING



YOUNG

Heat Transfer Products for Automotive and Industrial Applications.

Heating, Cooling, Air Conditioning Products for Home and Industry.

YOUNG RADIATOR COMPANY

Dept. 402-E • RACINE, WISCONSIN
Factories at Racine, Wisconsin and Matteson, Illinois

YOUNG ALL The Way . . .

provides complete heat transfer products for any requirement. Complete facilities for manufacture of component parts, a complete selection of all core types, engineering and production know-how coupled with progressive research both in laboratory and field assure the most efficient in heat transfer equipment.

Complete detailed information will be sent on request.

**"... free as a nation
and financially independent
as individuals."**

OLIVER P. ECHOLS

Chairman of the Board, Northrop Aircraft, Inc.



"For nearly every American, systematic saving during productive years is the best means of insuring future security. We at Northrop Aircraft believe in the Payroll Savings Plan. We feel that bond purchases contribute greatly toward keeping us free as a nation and financially independent as individuals."

In addition to a deep, personal interest in his own company's Payroll Savings Plan, Mr. Echols is Chairman of the Aircraft Industry Committee to build employee participation in the Payroll Savings Plan.

- When Mr. Echols' Committee was formed, 17 major airframe manufacturers and 11 major suppliers, employing 400,000 workers, had a total of 80,000 employees enrolled in the Payroll Savings Plan.
- At Mr. Echols' request all 28 companies agreed to conduct person-to-person canvasses among their employees.
- The first companies to complete their canvasses report a total of more than 70,000 new Payroll Savers bringing the industry total to more than 150,000 participants.
- In the first reports on campaigns, average payroll participation (companies reporting) went from 20% to 32%. Latest indications are that the average participation—all 28 companies—will be well over 50% by the time the canvasses are completed.
- It is estimated that the 70,000 new Payroll Savers already added to the Plan through the co-operation of Mr. Echols and his Committee will purchase more than

15 million dollars worth of Series E Defense Bonds during the next twelve months.

Has every employee of your company been offered an opportunity to enroll in the Payroll Savings Plan? If not, phone, wire or write to Savings Bond Division, U. S. Treasury Department, Suite 700, Washington Building, D. C. Your State Director will help you conduct a person-to-person canvass.

**Typical Companies Reporting Results of
Person-to-Person Canvasses, Payroll Savings Plan.**

| | Before Canvass | After Canvass |
|--------------------|---------------------------|--------------------------|
| Hughes Aircraft | 38.7% | 85.8% |
| Continental Motors | 10% | 70% |
| Boeing Aircraft | 17.8% | 55.1% |
| Rohr Aircraft | 1.3% | 77.6% |
| Solar Aircraft | 1.8% | 60.5% |
| Bell Aircraft | 14% | 50% |

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

Editor—DIESEL PROGRESS



When They
Step up
Service in
Shelbina...

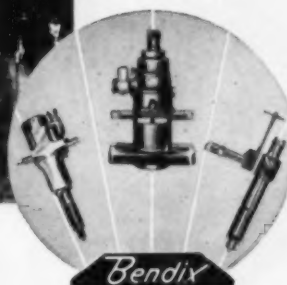


Baldwin series 700
diesel engine of 750
hp at 300 r.p.m. uses
Bendix Fuel Injection
equipment.

BENDIX
FUEL INJECTION
and

BALDWIN
DIESEL ENGINES

Step in!



Municipal electric power has a 56 year history in Shelbina, Mo., a town of 2000 inhabitants, located about 100 miles northwest of St. Louis.

Diesel powered since 1932, the equipment used in Shelbina power plant has been progressively modernized to meet ever increasing capacity requirements. The latest addition is a Baldwin diesel series 700 with Bendix Fuel Pumps and Injection Equipment.

In the great advance that diesel power is making, Bendix fuel injection equipment, together with outstanding diesel engine manufacturers, is playing an increasingly important part.

SCINTILLA MAGNETO DIVISION of

SIDNEY, NEW YORK



Export Sales: Bendix International Division,
72 Fifth Ave., New York 11, N.Y.

Western Market Office: 582 Market Street, San Francisco 4, Calif.

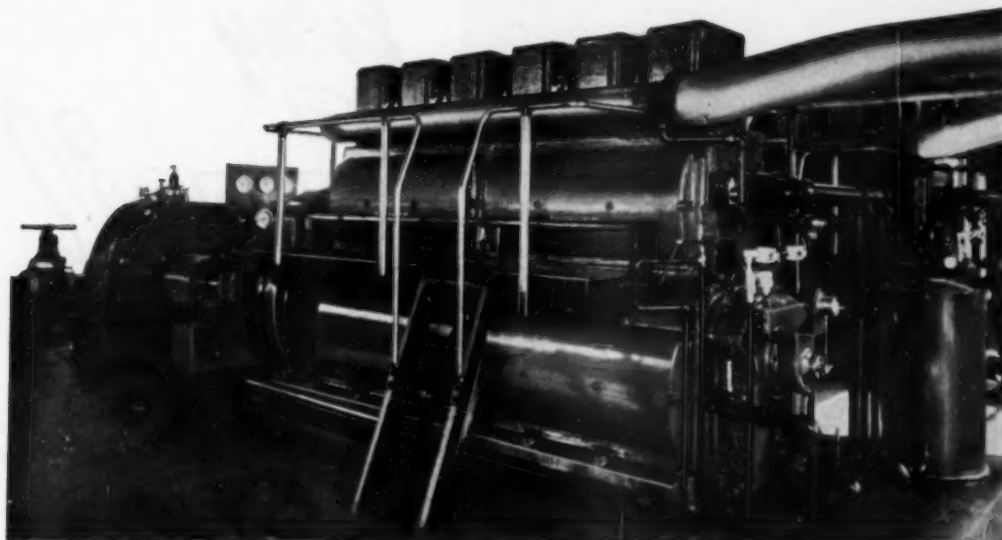


THE final result of this youngster's activity is entirely dependent upon his ability. He stands or falls on his own. That's the way we here at Erie Forge approach your problem—we take it over completely—One Control—One Responsibility. Every step—from raw material to finished crank is accomplished here. Design, metallurgical control, casting, heat treating, forging and machining are under the constant watchful supervision of fine craftsmen with many years of experience.

Consult with us on your next requirements for crankshafts, connecting rods or allied items.



at the Anthony Station of Magnolia Pipe Line . . .



89.6%

of elapsed time

for 11 years...that's Alco dependability

On-the-job performance—the toughest test of all shows what Alco Standardized Diesels can do. Two of these engines installed at the Anthony Station of the Magnolia Pipe Line have each rolled up over 90,000 hours of operation since installation. They have run as much as 94.9% of the elapsed time in a single year.

In addition to this kind of performance, pumping station superintendents also like Alco Standardized Diesels because of their economy:

- Compactness for lower construction costs
- Higher engine efficiency for lower fuel costs
- Medium speed for lower auxiliary equipment costs
- Flexible power range for lower expansion costs

In the last ten years more Alco Diesel Engines have been installed in oil pipe line pumping service in the United

States and Canada, than any others. To find out how they can help you, contact your nearest American Locomotive Company Sales Office at Beaumont, Chicago, Cleveland, Houston, Kansas City, New York, San Francisco, Schenectady or St. Louis.

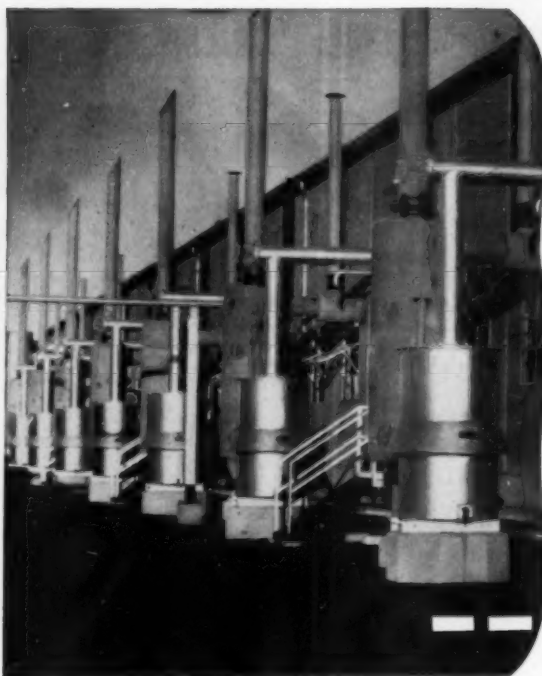
ALCO DIESELS



THE MARK OF MODERN ENGINEERING

AMERICAN LOCOMOTIVE COMPANY

In step with tomorrow—ALCO AIRCOOLERS, Heat Exchangers, Evaporators, Feedwater Heaters, Pressure Vessels, Pipe



Every Cycoil

is a
**SAVINGS
BANK**

Freedom from Dust-Damage Cuts Repairs and Costly "Down Time"

Each of the Cycoil Oil Bath Air Cleaners serving these eight 1200 hp engines actually "doubles" as a savings bank. The dust it collects represents hard cash that *won't* be spent on engine repairs and resulting shutdowns due to dust-damage.

Here's why you are assured of tangible, continuous savings over the years with

Cycoil. This air cleaner is designed to operate at 100% efficiency in the removal of damaging dust. Over 90% of the total fine-dust content of the air is trapped by Cycoil oil-bath action even before reaching the filter pads. Positive oil circulation for continuous self-cleaning action, plus the added filtration to be had in the filter pads, results in approximately 100% clean air.

Write for Bulletin No. 130. It gives you the detailed story of Cycoil's proven design and high efficiency.

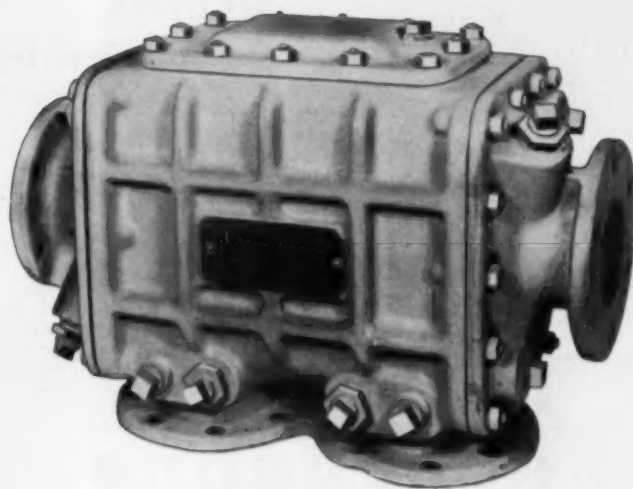


American Air Filter

COMPANY, INC.

408 Central Avenue, Louisville 8, Kentucky • American Air Filter of Canada, Ltd., Montreal, P. Q.

If it's a
HARRISON...
it's a dependable
heat exchanger



Harrison heat exchangers—oil coolers, water coolers—can be depended upon to do their specific cooling jobs efficiently—in any, and every application.

Diesel engine manufacturers know that Harrison products are designed right and made right. They know, too, that Harrison's engineering, manufacturing and testing facilities are always available to them.

Harrison welcomes the opportunity to discuss heat transfer problems with customers at any time.

HARRISON

HARRISON RADIATOR DIVISION, GENERAL MOTORS CORPORATION, LOCKPORT, N. Y.

MAY 1952

21

Engines
Regulated by

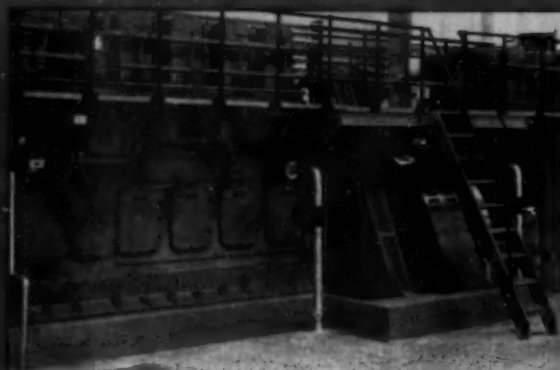
Marquette HYDRAULIC GOVERNORS



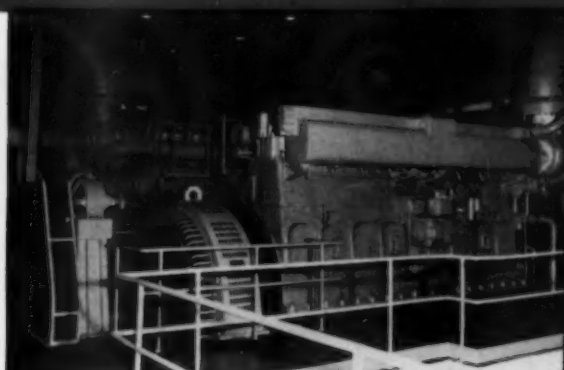
The **Marquette**
METAL PRODUCTS CO.
CLEVELAND 10, OHIO
A SUBSIDIARY OF CURTIS-WRIGHT CORPORATION

Also Manufacturers of:
ROLLED BEARING TEXTILE SPINDLES
WINDMILL WIPERS FOR AIRCRAFT, TRUCKS AND BUSES
TANK OIL PUMPS AND INJECTORS
PRECISION PARTS AND ASSEMBLIES

DIESEL PROGRESS



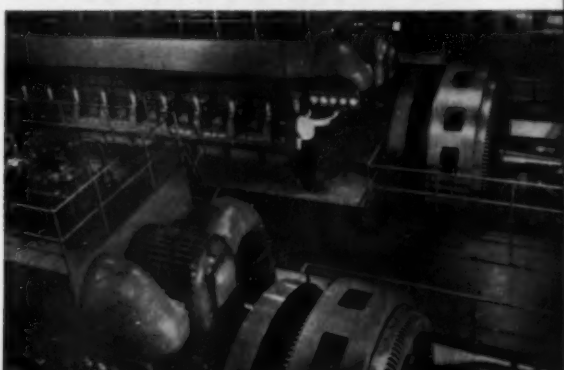
1



3



2



4

Four more tough power problems solved with Westinghouse A-C Generators

1 When Westinghouse was asked to sandwich an a-c generator in between two big twin diesels, an unusual application problem developed. One question was—how to insulate against the flow of shaft currents. Westinghouse engineers came up with a special coupling insulation that paved the way for future installations of this type.

2 Starting 1,000-hp motors at a large western cement plant puts a heavy load on ordinary generators... causes considerable voltage drop. Power plant specifications called for a minimum voltage drop. Westinghouse engineers solved the problem with the special generators pictured above—typical of the problem-solving ability offered by Westinghouse.

3 Cooper-Bessemer, called on to install a gas-diesel, engine-driven generator at the Yuma, Arizona plant of the Arizona Edison Company, selected the generator that could match the full-load, around-the-clock performance of the 16-cylinder, gas-diesel engine. They chose Westinghouse.

4 At the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics, the problem was to supply supplementary power at peak loads to operate the large wind tunnels, and stand-by power to serve the general research needs. Four Westinghouse 6,600-volt, 2,500-kw, a-c generators have been successfully meeting these demands for the past ten years.

What about your tough power problems? Call your Westinghouse representative and let him help you arrive at the best solution. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-10381

YOU CAN BE SURE THAT THE

Westinghouse

A-C GENERATORS

A-C GENERATORS

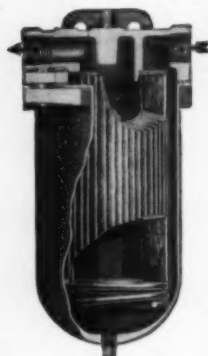


Bendix-Skinner

ORIGINATOR OF MICRONIC FILTRATION

Results Prove It
the *Finest*
Name in Filtering

Nine times out of ten **Bendix-Skinner** Filters will supply the "finest" answer to your filtration problems. Here are the facts: available with specially designed, resin impregnated cellulose elements; simple, quick replacement; high flow rate with minimum pressure loss; no channeling or bypassing; over 350 models providing filtration from $\frac{1}{2}$ micron (.000019") upwards at flow rates from 1 to 5000 g.p.m. Why not let **Bendix-Skinner** filtration engineers work with you? Write us direct.



Model 3770-P filter element, $6\frac{1}{2}" \times 3\frac{1}{2}"$, has a filtering area of 940 sq. in.



SKINNER PURIFIERS DIVISION OF

1503 TROMBLY AVENUE,
DETROIT 11, MICHIGAN

Export Sales: Bendix International Division, 72 Fifth Ave., N. Y. 11, N. Y.



SAFETY ALARM SETS

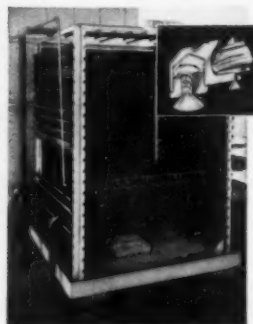
The Synchro-Start Alarm Sets are designed to give audible and visual alarm in case of any abnormal condition of the engine. Any number of individual signal lights indicate overheating, low oil pressure, low air pressure, etc., and can be furnished with automatic shut-down if alarm is not heeded.

Three switches are provided for testing, audible alarm cut-off, and a safety switch for emergency shut-down.

For further information write for Bulletin 407

SYNCHRO-START PRODUCTS, INC.

8101 NORTH RIDGEWAY AVENUE, SKOKIE, ILLINOIS.



BEATS THE HIGH COST of wasted cooling water!

View showing placement of heat exchange coils in cooling tower with inset illustrating spraying action of nozzles (at top).

Now you can save money by using the same jacket water over and over again. With a Binks Closed Type Cooling System, soft or chemically treated water from the engine is pumped through coils located in the cooling tower. Engine water is cooled by the spraying action of raw water on the coils. Raw water and the pure jacket water never mix. Scale formation is eliminated and engine efficiency increased.

Because both the jacket water and raw water are constantly recirculated, cooling water costs are virtually eliminated.

Send for free copy of "COOLING SYSTEM LAYOUTS FOR BEST DIESEL PERFORMANCE" Tells how to select best cooling system for your specific application. No obligation.



Binks

MANUFACTURING COMPANY

3132-38 Carroll Ave., Chicago 12, Ill.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

HERE'S MORE HORSEPOWER TO YOU!



Combustion is *better* because 40% more air is trapped in the cylinder . . . squeezed into the fuel spray cone as piston reaches top dead center.

You can burn *heavier* fuel oil.

Rating is the *same* on either diesel fuel or gas.

Exhaust is *cleaner, cooler* on the heaviest fuel.

You get **MORE HORSEPOWER** per cylinder size and speed than in any equivalent engine—without increase in pressure or in temperature.

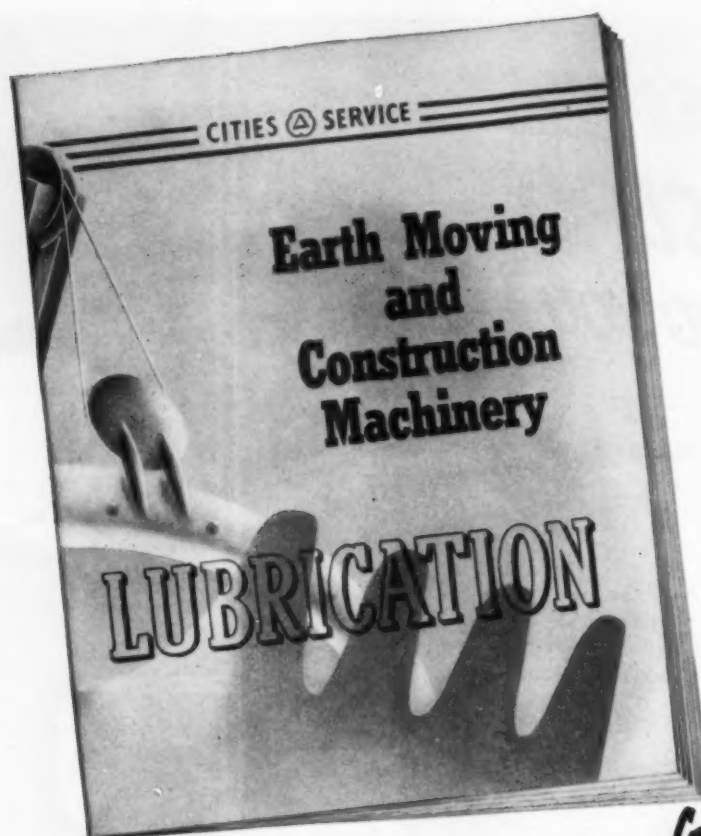
Sturdy unit construction gives the Hamilton rotary exhaust valve long life, easy maintenance.

Write for Bulletin 215A951



Lima-Hamilton Division
Baldwin-Lima-Hamilton Corporation
Hamilton, Ohio

BALDWIN-LIMA-HAMILTON



Have you received your 1952^{free} edition?

FOR YEARS, men in construction and allied fields have found this lubrication book tremendously helpful. It not only discusses the basic fundamentals of lubrication, but it gets right down to specific lubricating techniques for all your equipment.

Proper use of the practices outlined in this book, plus the full line of Cities Service Quality Lubricants can:

- **Lengthen the life of your equipment.**
- **Increase productivity.**
- **Speed up operation.**
- **Save on operating costs.**

If you're the boss and owner, it protects your investment, increases profits and simplifies your operations. If you're working for the boss, proper use of this book will help you on the job. Write now for your 1952 edition of EARTH MOVING AND CONSTRUCTION MACHINERY LUBRICATION, CITIES SERVICE OIL COMPANY, DEPT. E 13, Sixty Wall Tower, New York City 5.

CITIES  SERVICE
QUALITY PETROLEUM PRODUCTS

DIESEL and GAS ENGINE PROGRESS

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

REX W. WADMAN *Editor and Publisher*
SIDNEY HOFFMAN *Assistant Editor*
CHARLES F. A. MANN *Associate Editor*
WILBUR W. YOUNG *General Manager*
DORIS N. O'HARA *Production Manager*
PEGGY R. TOMACK *Mgr. Reader Service*



CONTENTS FOR MAY, 1952

| | |
|---|----|
| Three New Reading Tugs..... | 29 |
| Large REA Meets Load Problems..... | 32 |
| Diesels Take Cattle To Market..... | 34 |
| Pink Gold..... | 36 |
| City of Estherville, Iowa..... | 38 |
| Toughest Job Goes To Diesels..... | 41 |
| Crete, Nebraska..... | 42 |
| Brynn Foss..... | 44 |
| Power Plants on Wheels..... | 47 |
| Outboard Propulsion Finds Its Place..... | 48 |
| Short Cut to Diesel Maintenance..... | 50 |
| The Elisha Woods..... | 52 |
| It Ain't Sol..... | 54 |
| Exchange Your Diesel Maintenance Ideas..... | 56 |
| What's Going On In England..... | 58 |

EDITORIAL AND PRODUCTION OFFICES

816 N. La Cienega Blvd.

Los Angeles 46, Calif.

NEW YORK 36:
 Wilbur W. Young
 2 West 45th Street
 Murray Hill 2-7333

BUSINESS OFFICES

LOS ANGELES 46:
 Sidney Hoffman
 816 N. La Cienega Blvd.
 BRadshaw 2-6273

LONDON E.C. 4:
 G. L. Featherstonhaugh
 342 St. Paul's Corner
 Ludgate Hill

TULSA 3:
 O. F. Cozier
 515 McBirney Bldg.
 4-5555

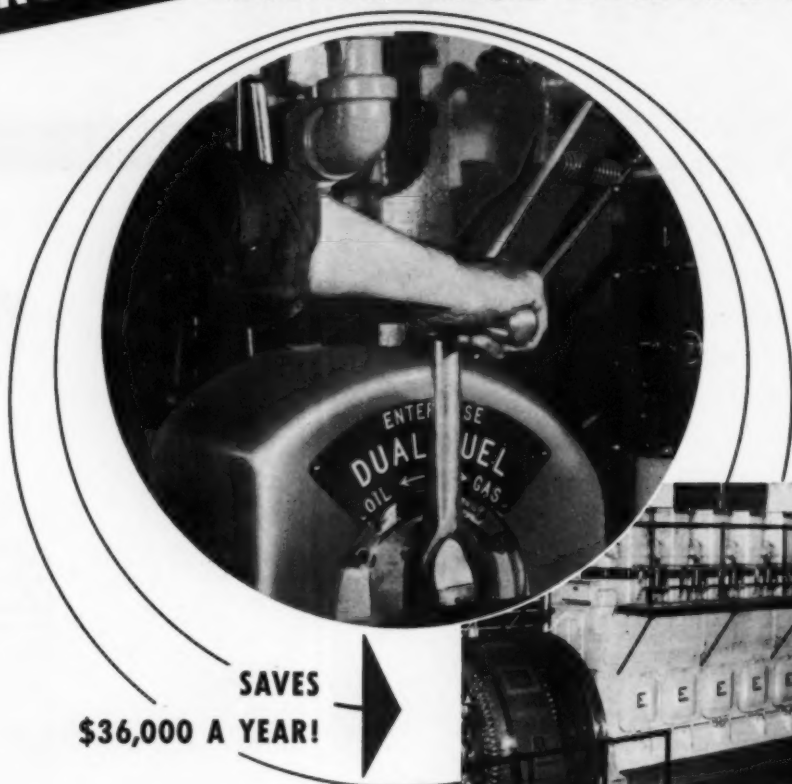
DIESEL PROGRESS for May, 1952, Vol. XVIII, No. 5. Published Monthly by Diesel Engines, Inc., 816 N. La Cienega Blvd., Los Angeles 46, California. Tel. BRadshaw 2-6273. Subscription rates are \$5.00 for U.S.A. and possessions. All other countries \$7.50 per year. Subscriptions may be paid the London office at £2-12s-6d per year.

DIESEL PROGRESS is indexed regularly by Engineering Index, Inc.



PROVED

ENTERPRISE *Dual Fuel* Power



Wherever natural or sewage gas is available in sufficient quantities, Enterprise DUAL-FUEL engines provide a maximum operating efficiency at greatly reduced fuel costs.

Initial selection of operating fuel is manual, with smooth and positive changeover from one fuel to the other simplified through Enterprise single-lever control.

Any fluctuation in gas pressure is compensated for automatically by a corresponding increase or decrease of the gas-fuel ratio, thereby maintaining constant engine speed and load.

Get full details on quality-built cost-saving Enterprise DUAL-FUEL engines today. Models from 68 to 1755 BHP per unit, generator sets to 1250 KW, turbo-charged or normally aspirated.

Two Enterprise Dual Fuel Units are now in service at the Municipal Utilities plant in Broken Bow, Nebraska. Their combined capacities of 1800 KW more than doubles the capacity of the three straight diesels formerly in operation—at an estimated saving of \$36,000 per year in fuel costs alone!



ENTERPRISE ENGINE & MACHINERY CO.

A Subsidiary of General Metals Corporation
18th & Florida Sts., San Francisco 10, California

BOSTON • CHICAGO • FT. WORTH • KANSAS CITY • LOS ANGELES • NEW ORLEANS • NEW YORK • SEATTLE • ST. LOUIS • WASHINGTON, D. C.

T
ban
ing
barg
Har
are
100
can
N. J
land
14 h
trip.
Shan
the
the
prod
Com
comm
tion

THREE NEW READING TUGS

Powered by 1600 Hp. Fairbanks-Morse Opposed-Piston Diesels, New Vessels Cut Towing Time and Operating Costs

THREE identical streamlined diesel tugs, each powered by a 1600-hp., opposed-piston Fairbanks-Morse engine, have replaced four coal-burning steam tugs and taken over all handling of coal barges for the Reading Company in New York Harbor. According to the owners, the diesel tugs are almost twice as fast as the steam tugs and are 100 percent more efficient in maneuverability. They can make the customary run from Port Reading, N. J., to 96th St. on the East River with several landings, a distance of about 26 nautical miles, in 14 hours. The steam tugs took 21 hours for the same trip. The FM dieselized *Tamaqua*, *Pottsville* and *Shamokin*, all of which are now in service, replaced the *Ashbourne*, the *Patience*, the *Wyomissing* and the *Bern*. The new tugs are named for famous coal producing cities in Pennsylvania along the Reading Company's tracks. Thomas D. Bowes, M.E., was commissioned to design and supervise the construction of the diesel tugs; the RTC Shipbuilding

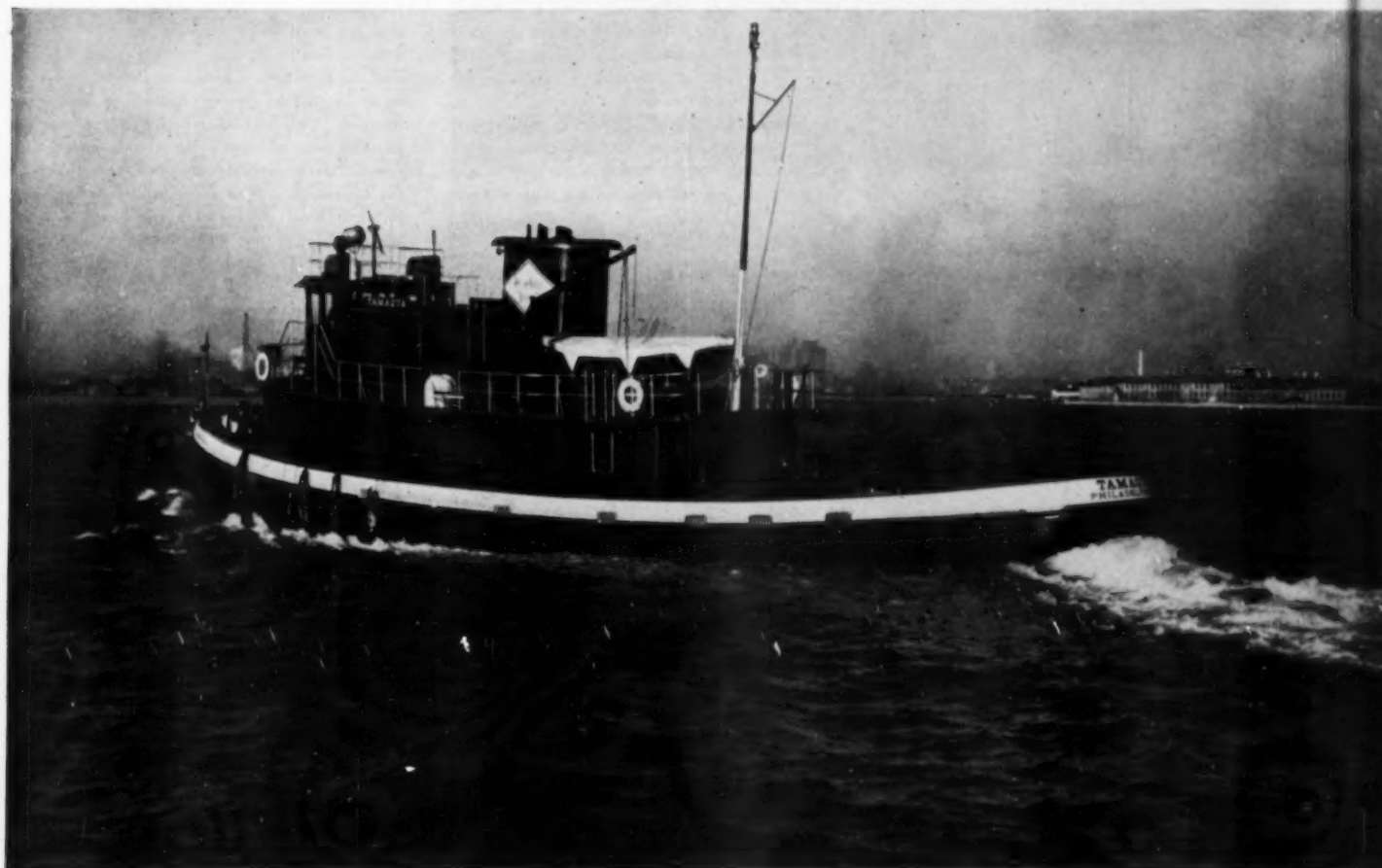
Corporation of Camden, N. J., was awarded the contract for their construction.

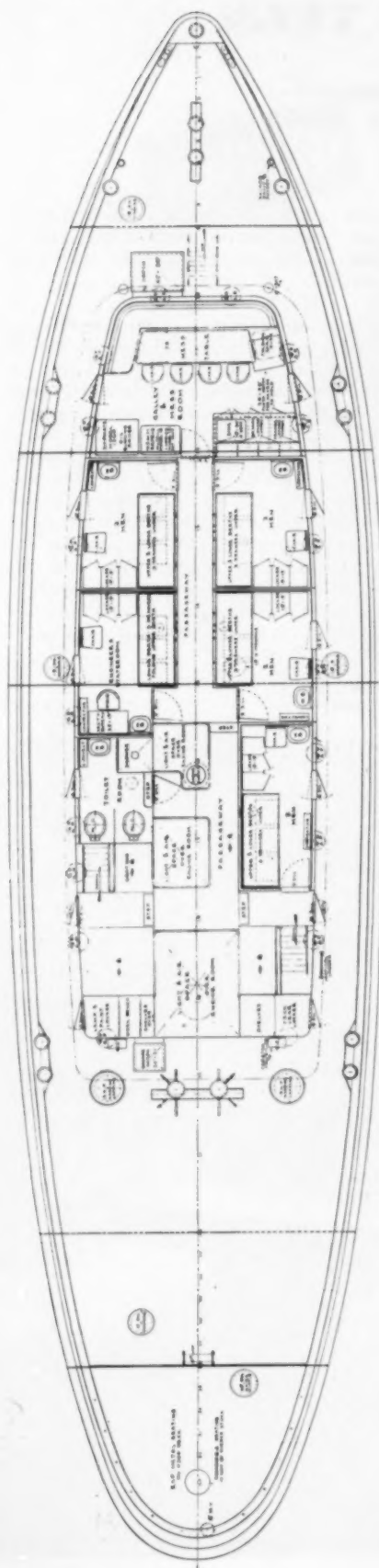
With no direct rail transportation to a very great part of the city, New York and its Harbor are dependent almost entirely upon water transportation for fuel—both coal and oil—and for the handling of much incoming and outgoing freight to and from the piers. This is the reason for the very large fleet of tugs, coal and oil barges, lighters and car floats operating in the Harbor. Many years ago the Reading Company established Port Reading, N. J., on the Arthur Kill above Perth Amboy to handle the distribution by barge of Reading Anthracite and other types of coal. Port Reading is equipped with modern dumper equipment and has handled over 4,000,000 tons of coal a year from Port Reading to New York and Brooklyn. An estimated 75 percent of this work is for utilities. The tugs may be single barges with a capacity of as

much as 2200 long tons and a draft of 17 ft. aft and 16 ft. forward, or a flotilla of barges of from 8000 to 10,000 tons. The tugs operate on a 24-hour schedule.

Coal is delivered to docks on the East River and the North River. The towing limits are 96th St. on the East River, 60th St. on the North River and 69th St. in South Brooklyn. The Reading Company maintains a stake boat off the lower end of Manhattan Island to facilitate distribution to the two rivers. When a flotilla reaches the stake boat, the barges for one river are made fast and the tow continues on up the other river where it delivers loaded barges and collects empty ones which are taken back to the stake boat and made fast. The tug then picks up the loaded barges which had been left behind on the first trip and proceeds up the other river, delivering the loaded barges and picking up the empties. When the tug gets back to

The *Tamaqua* was the first of three new tugs to be put in service in New York Harbor by the Reading Company. Each vessel is powered by a 1600 hp. Fairbanks-Morse opposed-piston diesel.





The general construction of the tugs is on the longitudinal system with heavy vertical flat bars spaced 22 in. from sheer to keel and keep frames spaced every 6 ft. with intermediate webs and bilge brackets. The longitudinal system extends from the forepeak bulkhead to the afterpeak bulkhead. The framing is athwartship forward and aft of these bulkheads. The hull is divided by five watertight bulkheads to provide strength and safety. The heavy intermediate floors spaced under the engine bearers, with the vertical stanchions in way of the engine room, produce a super strong hull which will stand the heavy pounding a tug is subjected to in service. This type construction also reduces the vibration and is cheaper to maintain.

A 10-cylinder, 8 $\frac{1}{4}$ x 10-in., opposed-piston Fairbanks-Morse diesel developing 1600 hp. at 720 rpm. powers each of these tugs. The engines drive the Ferguson propellers through Falk Airflex clutches and reverse-reduction gears with a reduction ratio of 3.464 to 1. The main diesel on the *Tamaqua*, *Pottsville* and *Shamokin* has a closed fresh water cooling system which includes a Ross heat exchanger. Piping is arranged so that in winter hot raw water can be discharged into the sea chests to prevent freezing or slushing up. The sea chests can be blown with compressed air to remove any foreign material that may come through the screens. The pressure lubricating oil circuit includes a Ross oil cooler and a Purolator filter. The engine exhausts through a Maxim silencer.

Two air-cooled Quincy compressors mounted on a common base, each with a capacity of 13.7 cfm. at 250 psi., provide compressed air for starting the main engine and for other purposes. They are V-belted to 3-hp. Fairbanks-Morse motors. The well arranged auxiliary equipment includes Fairbanks-Morse lube oil and fire pumps, a Carter self-priming bilge pump, a centrifugal fuel oil transfer pump, a 17-point Alnor exhaust pyrometer, Bowers ship service batteries and R.T.C. switchboard. Auxiliary power on each of the three tugs is provided by two 3-cylinder Model 49A4 $\frac{1}{2}$ -3G Fairbanks-Morse generating sets rated at 40 kw., 125 volt, dc. at 1200 rpm. These self sufficient marine-type units are fitted with heat exchangers, fresh and raw water pumps, oil-bath type intake air filters and silencers, exhaust silencers and engine instrument panels. They are arranged for electric starting with 24-volt starting motors and battery-charging generators together with 24-volt heavy-duty batteries. There is a complete supply and exhaust ventilating system for the engine room on each tug with one Propellair duct fan for supply and one for exhausting both from above and below floor plates. A forced hot water system with an oil-fired Spencer boiler and convector radiator is used to heat the vessel. All three tugs have pilot house controls for the engine both port and starboard and on the after end of the main deck house where there is also a control for the steering gear. These deck controls, which facilitate swift and efficient operation of the tugs, are by Allis-Chalmers and Henschel. Pilot house equipment also includes marine radio-telephone.

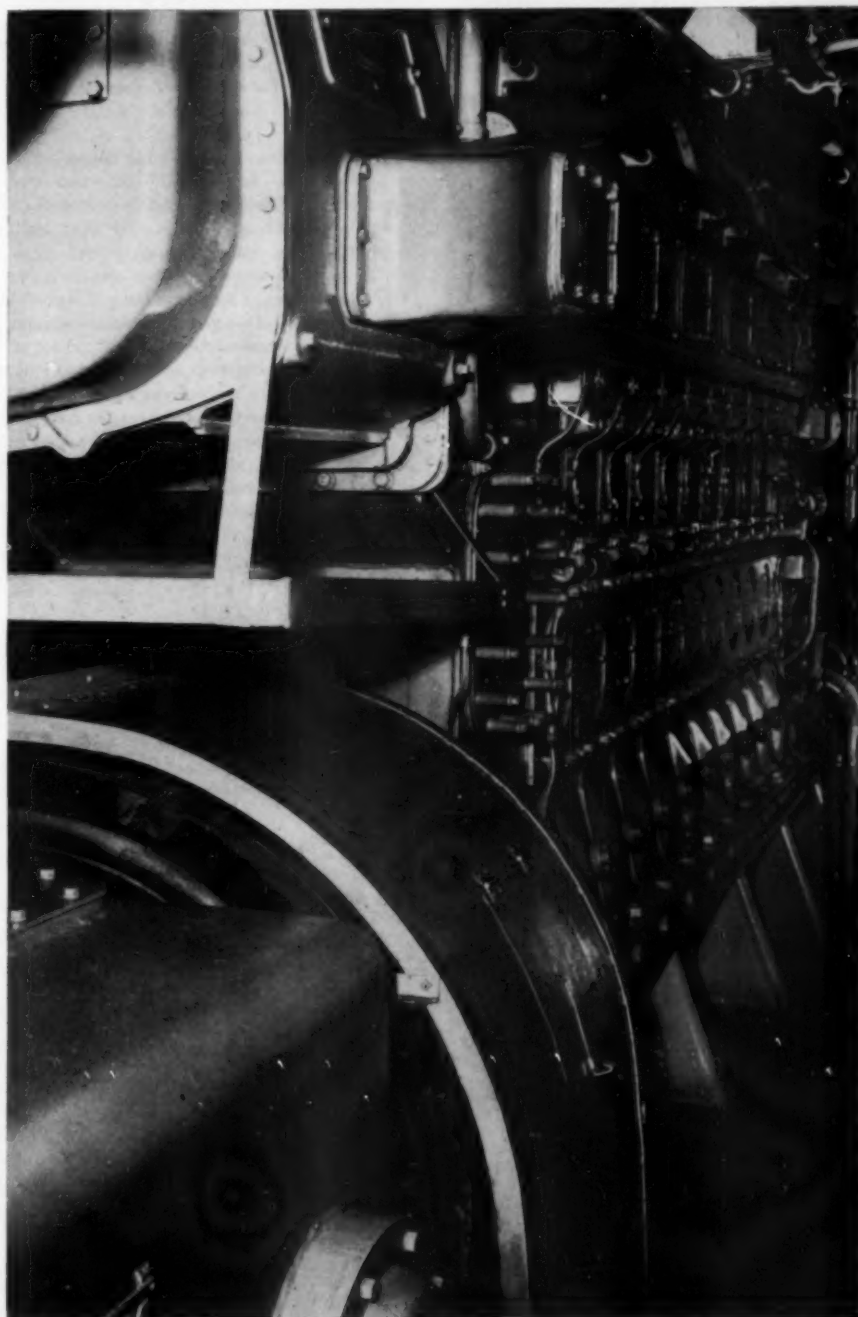
The crew's quarters are commodious and there is a very large Captain's stateroom just aft of the wheel house. On deck, just aft of the galley, are

four double staterooms for the crew and a large comfortable stateroom for the engineer. There are bathroom facilities for the crew and the officers on the port side. A combination galley and mess room, located below the wheel house, is trimmed in stainless steel and equipped with an oil-burning Shipmate range and a McCall electric refrigerator. There is also a Victor deep freeze in the forward hold. Both the sanitary and potable water systems are supplied by Fairbanks-Morse pressure sets. There is a paint locker at the after port end of the main deck house, a deck gear locker in the corresponding space on the starboard side. Under the

fore deck is a large storage hold with wire mesh lockers for storage of spare engine parts and such other necessary spare gear as hawsers. On the after deck there are two large electric-driven Wheeler capstans for handling hawsers.

These swift powerful tug boats soon will be joined in New York Harbor by several other identical vessels operating in other service for other owners. As the Reading Company has proved, these tugs, with their work-horse F-M diesels, can increase speed, efficiency and economy in the movement of freight and the handling of ships.

The main propulsion engine for the *Tamaqua* is this 10-cylinder, opposed-piston Fairbanks-Morse diesel which develops 1600 hp. at 720 rpm.



LARGE REA MEETS LOAD PROBLEMS

By HENRY GREINER*

FACED with an increasing load on our transmission system, it becomes necessary for us to increase our transmission capacity in the way of voltage and conversion from single phase to three phase. As it would mean the shutting off of service to many substations, which not only service Rural areas but also villages and towns, it was definitely a condition which had to be met by furnishing power from some other source. As it would be necessary to energize a number of substations located quite some distance apart, the only means which could be used would be to have a suitable sized generating unit mounted on a trailer.

After considering the present system as to location, size, voltage, phase, peak demand and the equipment which we had, it was decided to assemble a generating unit, complete in itself, which could be moved from place to place as needed. Work was started on the construction of a complete mobile trailer unit consisting of the following: 715 bhp., 514 rpm., 500 kw., 450 volts, and 3 phase directly connected. This semi-portable direct connected unit was mounted on a semi-trailer. As this unit had an overall length of 25', a height of 9' and a gross weight of 58,000 lbs., it was necessary to take considerable precautions to help in the accurate alignment at all times. This was done by the use of an extra heavy duty trailer to further assist in firming the bed of the trailer and to secure clearance for the engine sump. An 8" x 10" x 20' wooden beam was placed

under each side of the unit. On these beams were mounted twelve, (six on each side), spring absorbing shocks with a load capacity of 5,000 lbs. each. The complete generating unit was set on these, thereby giving support to the full length and a cushion to take care of any twisting or giving, which would come in the trailer while being moved over uneven road or ground. This complete assembled unit was retained and held in place by six $\frac{3}{4}$ " x 14" through bolts with cushion washers. These six bolts, on each side, extended through the engine sub-base and were anchored on the bottom side of the trailer bed. As this was a cushion mounting, it was possible to adjust the amount of support needed at any place, as shown by photo (1) on next page.

During the running time and while this unit was on location, this complete unit and trailer was supported by six large screw jacks mounted on a 2' x 2' plank footing, which gave an earth load of about 2,000 lbs., which is a fair load on average soil. In order to assure perfect crankshaft alignment when setting, a large leveling pad was machined on the top of the generator frame. After the crankshaft was measured for distortion and set at zero, this pad was scraped so that when a precision level was set, a zero reading was registered both length-wise and cross-wise of the engine and generator unit. When the unit is set and the level is placed on this pad, the main support jacks are adjusted so that a zero reading is reached. This assures perfect alignment of the shaft and complete unit. These jacks and trailer supports are shown in photo (2).

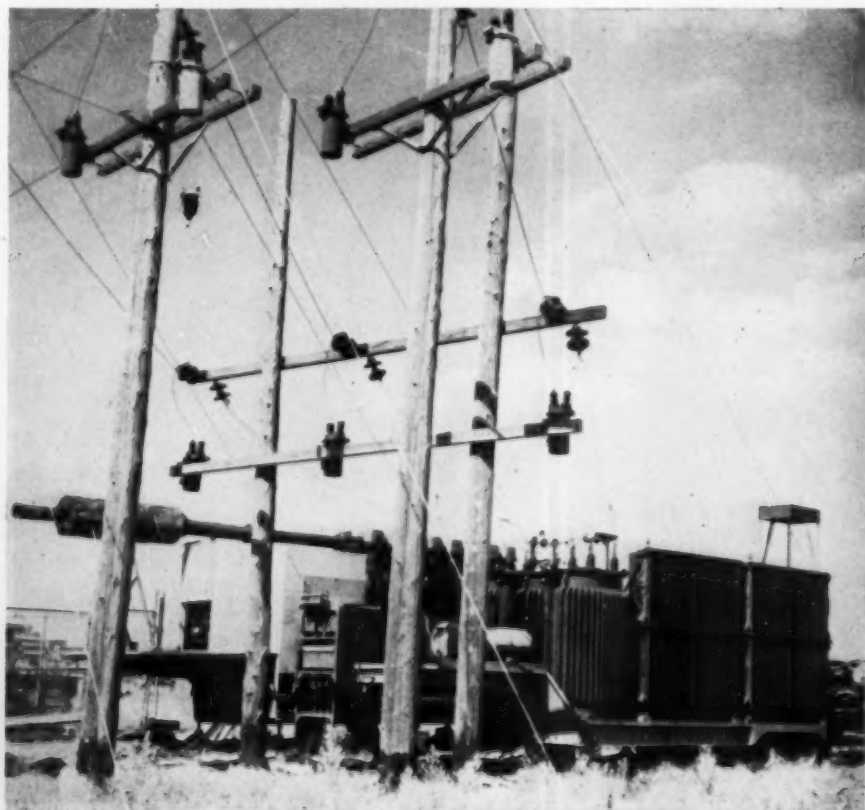
Also mounted on this trailer and permanently connected to the engine is a lube oil cooler and a 265 gallon fuel oil tank, lube oil filter and jacket water pump being directly connected to the engine. The jacket water and starting pipes are brought to one central point at the rear side of the trailer where they are flexibly mounted with the construction and equipped with the necessary valves so that they may be disconnected from other trailer units with a minimum loss of water. The fuel oil is not disconnected from the engine fuel pump so there is no chance of air locks in the fuel system.

Exhaust snubber was constructed from #16 gauge sheet iron for the body and #12 gauge for the ends and the tail pipe. This was connected to the engine by flexible coupling. This has a total area of 4,300 cubic inches. This unit has the following dimensions: 35' long, 8' wide, 12' 6" high with a gross weight of 75,000 lbs. This may seem excessive but this is caused by the heavy trailer mountings.

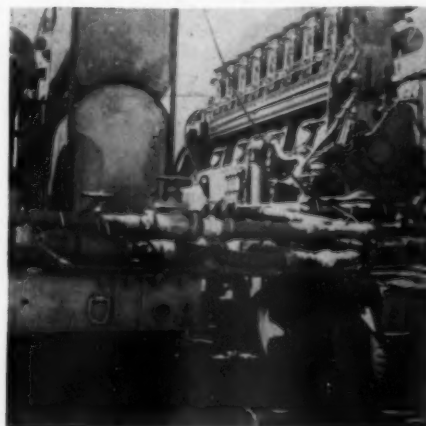
This construction was used to take the place of the concrete foundation which is necessary to stabilize the engine when in operation. This engine has operated more than 200 hours with no signs of motion or of vibration. (This can be seen in the photos, which were all taken while the unit was in operation). This unit is called Unit #1.

In conjunction with this unit, we have a small trailer carrying the following accessories: Two cooling radiators with dimensions of 9' x 8' each and with 42,000 btu. cooling capacity. These two radiators are piped in series. Water is piped as follows: From the discharge side of the pump, it enters the lube oil cooler, into the engine jacket, out of the top of the engine through the 3-way expansion valve. Then it returns to the pump until the desired temperature is reached. At this time the valve opens and some or all of the water is directed through the radiators. In order to further assist in the regulation of water temperature, the fan on the second passed radiator is automatically controlled. As this temperature control switch is

View of mobile unit at Circle Pines.



Mobile unit at Elk River.



*Maintenance Supt., Rural Cooperative Power Association, Elk River, Minn.

located in the cold water return pipe from the last radiator, this switch is set at whatever temperature that water is wanted to enter pump. This combination of 3-way valve and control switch does a very good job of water temperature control. During cold weather, anti-freeze solution is used. Water loss is made up from a 100 gallon storage tank on this trailer. This water is piped into the water piping and the water is blown into the system by pressure from the starting air bottle, through a regulating valve set at 6 lbs. Starting air bottle is pumped to 300 lbs. by a 7 hp. gasoline engine driven through an automatic load-pulley to the compressor.

Also mounted on this trailer is a 500 gallon fuel tank, as shown in photo 3. This gives a total 750 gallon of fuel which will operate the unit for 25 hours at full load. Fuel is transferred through a flexible coupling between tanks, by the same air as used to transfer water. Total water capacity is 325 gallon. Mounted in the forward end of this unit are the following banks of transformers: three-450 to 2400, 3 phase, 150 kw., three-2400 to 7200 volts, 3 phase, one-2400 to 110 volts which is used for lighting. Cooling fan motors are 10 hp. 440 volts which is taken directly from the generator. With this arrangement, the following voltages can be generated and supplied: 400 volts, 2400 volts, and 7200 volts. The switchboard has all necessary meters and controls and is set between the units, which are 6' apart and side by side with flexible pipe connections. New Unit #2 has dimensions of 20' long, 8' wide and 12' high with a gross weight of 60,000 lbs. and is supported by four jacks similar to the ones used under unit #1. This unit is leveled while in operation. In order to protect it from the weather and keep unit #1 warm in cold weather, this unit was enclosed by a

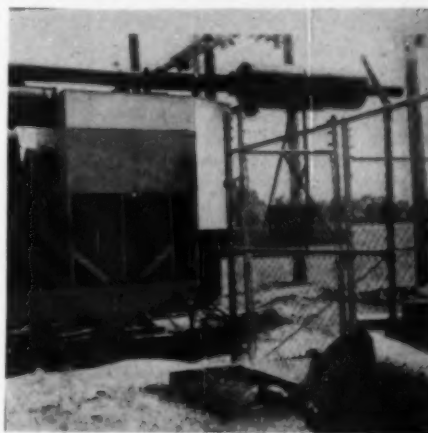
sectional building constructed of $\frac{1}{4}$ " plywood with a canvas roof. This total unit can be moved in place and put in operation in a very short time. Up to the present time, this unit has been on two different jobs and was moved three different times. It has proven to us that this is a practical means of meeting our power shortage problems such as: Voltage, Regulation, Energizing substations and Furnishing power in isolated areas.

List of Equipment

Engine—Baldwin VO, 8 cylinder, $12\frac{3}{4}$ x $15\frac{1}{2}$, 750 bhp., 514 rpm., aspirating engine.
 Generator—Allis-Chalmers, 500 kw. 625 kva., 450 volts, 3 phase, 60 cycle, direct-connected.
 Exciter—Allis-Chalmers, 8 kw. 125 volts, Anuhing type direct-connected.
 Switchboard—Allis-Chalmers.
 Lube Oil Clarifier—Briggs, using 6-A414 cartridges, By-pass flow.
 Air Compressor—Gardner-Denver—Lucy, Illinois Model ADA, $3\frac{1}{2}$ and 2 x $2\frac{1}{2}$.
 Air Compressor Eng.—Briggs & Stratton, 7 hp., 2200 rpm.
 Radiators—Young Radiator—2-232, Connected in series.
 Radiator Fan Motors—Westinghouse, 2-10 hp. 220/440 volts, 1750 rpm.
 Fan Motor Switches—Mercoid type DA-31.
 Fulton Syphon Valve—Used as water temperature control valve.
 Lube Oil Cooler—Ross 1207, Size 860.
 Fuel Filter—Nugent.
 Lube Oil Strainer—Purolator.
 Flexible Pipe Couplings—Flexonics Corp.
 Vibro Isolators—The Korfund Company, Inc., 14—Type LK/G-21-0.
 Transformers—Albertson, 150 kva. 450/2400. Wagner, 333 kva., 2400/2200.

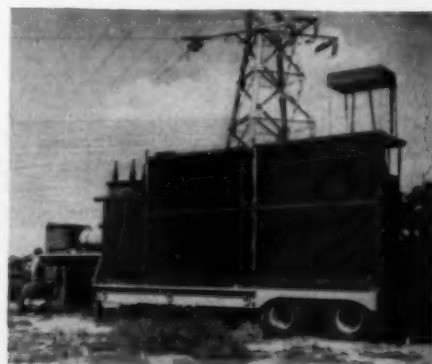
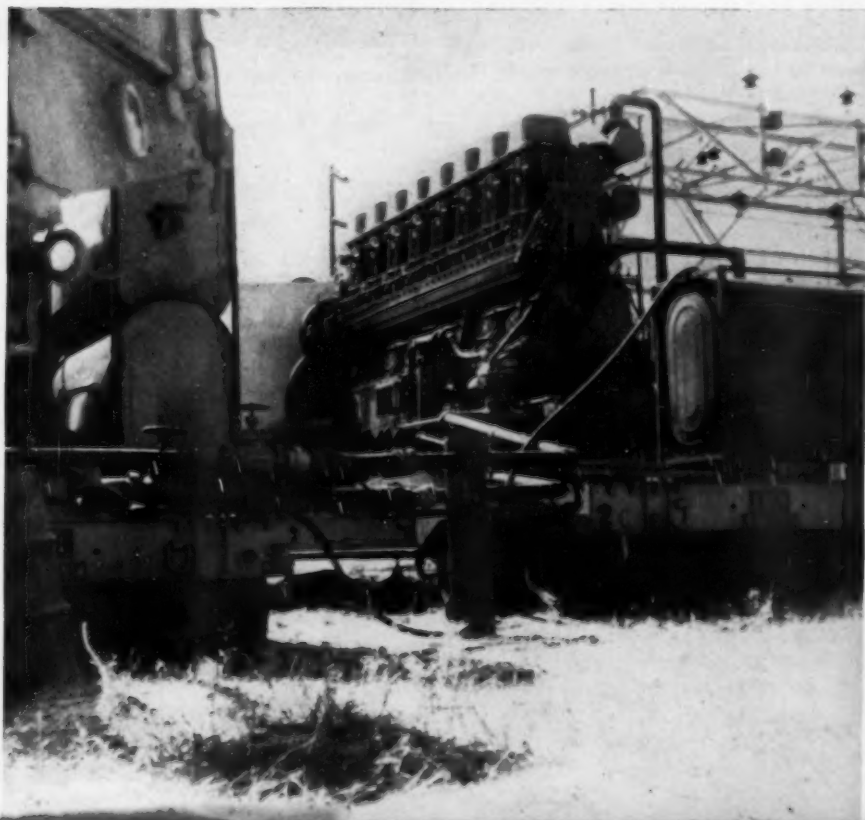


(Photo 1) Elk River mobile unit.

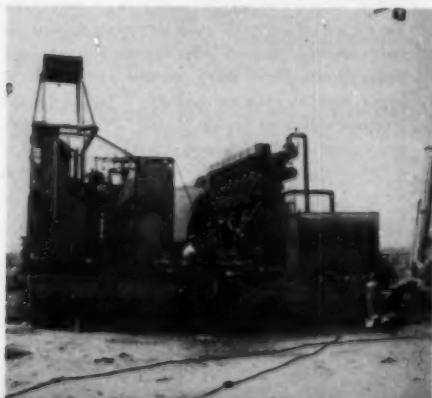


(Photo 2) Elk River mobile unit.

Another view of the mobile unit at Circle Pines.



(Photo 3)



DIESELS, NOT CHISHOLM TRAIL, TAKE CATTLE TO MARKET

By JAMES JOSEPH

CATTLEMEN admit that as western lore goes, you couldn't duplicate the Old Chisholm Trail—nor the saga of hundreds of thousands of head of cattle being herded over it. There was only one flaw in this romantic ointment. It just wasn't practical from beefmen's point of view. A cattle drive of only 40-50 miles often left the herds foot-sore and weary—but even more important, economically, each mile they walked shrank their weight. A 1500 mile cattle drive might start out with 1000-lb. beefs, end up with scrawny 500 pounders. But you'll admit, it made a fine movie.

Today it's a diesel, not Chisholm Trail. And largest cattle hauler in the west, among the 20 companies engaged in livestock transport, is Garibaldi Brothers, Los Angeles. Garibaldi truck and trailer combines, all of them diesel engined, range over seven western states (Arizona, California, New Mexico, Utah, Nevada, Idaho and Oregon). In a single year, this livestock fleet travels some 6,500,000 miles. Fifty-four truck and trailer units operate from four terminals, keyed and strategically located so that hauls to central marketing areas—San Francisco, Los Angeles and Stockton, Calif.—won't necessitate trips longer than 36-hours. This 36-hour limit is a governing factor whether cattle travel by diesel, stock train or by diesel truck, for the ICC requires that cattle must be unloaded for feeding and watering every 36 hours. Actually, Garibaldi's dieselized fleet hauls cattle off western ranges and into most California feeding and slaughter centers in an average 10 hours.

Of Garibaldi's 54 truck-trailer rigs, two are new Peterbilt cabover, 350-COE's, equipped with Cummins 275 hp. diesel engines; 12 are new Autocar DC-10064Ns, likewise installed with Cummins 275 hp. engines. Because almost all runs are over mountains, the entire fleet has an average horsepower of 225—with no single rig less than 200 hp. All of Garibaldi's remaining 150 hp. Cummins engines have been supercharged to 200 or 225 hp.

Garibaldi's drivers are a cross between first-class wheel-handlers and experienced cow hands. Actually, as Dave Garibaldi, the company's president and manager, is quick to admit, drivers aren't hired on the basis of their history as farm hands. But it helps. Many a rig, loaded with milk cows, has pulled off the road while the driver milked the dairy animals. "Got to," says Harold Nicol, a Garibaldi driver, "haul dairy animals more than 12 hours without milking and you'll pull into the terminal with a lot of ruined cows." Nicol, although not typical of all Garibaldi drivers, grew up on a California cattle ranch. Says Garibaldi, "When we get a shipment that looks as if it'll need milking, we dispatch a driver who knows his udders."

Garibaldi Bros. uses several sizes of racks. Truck

racks are usually 8-ft wide, 22-ft long, and have gates up to 6-ft high. Trailer racks run about 8-ft wide, 25-ft long, and have the same gate arrangement. A cabover truck-trailer rig has about 408 sq. ft. of loading space, while the regular truck-trailer combinations have approximately 376 sq. ft. It requires three diesel truck and trailers to haul an average-size shipment of 135 animals.

Both four-wheeled and 6-wheeled trailers are used by Garibaldi, and each has its special function. The 6-wheelers are put on runs where there's ice and snow—especially in Nevada and the California mountains. Six wheelers, Dave Garibaldi believes, skid less than the 4-wheeled trailers. Four wheelers are used mostly in the dryer, more southern areas of the company's hauls. Garibaldi believes that a straight 200 hp. diesel engine is the most economical for livestock haulage. "These rigs and their engines spend less time in the shop for overhauls; use less fuel, and generally, not being as high-powered as some rigs, seem to save tires." He points out, for instance, that the starting horsepower of a diesel truck engine has a lot to do with tire wear. His figures seem to back up this contention. For instance, a 4-wheel drive, 200 hp. rig will get 100,000 miles to a set of tires, while a 4-wheel drive, 275 hp. truck gets about 70,000 miles before tire change. It might seem strange that after this appraisal, the company has recently purchased trucks with 275 hp. diesels. Despite this analysis, Garibaldi has found that even though more tire wear comes with more powerful engines, the higher the horsepower, the better the rigs climb the mountain roads on his runs. Faster haulage time weighs strongly against tire savings—so that's the reason for this apparent inconsistency.

One of the battles that livestock shippers wage daily is getting cattle from the western grazing ranges to pre-slaughter feed lots with the least weight loss. Wade Sherrard, general manager of the California Motor Transport Associations, Inc., in a talk before the Vernon (Calif.) Kiwanis Club, recently admitted that all cattle shippers, whether by rail or truck, must reckon with shrinkage. "There is bound to be some shrinkage," Sherrard said, "whether the cattle move by truck or by rail, but the loss is less on a quick trip than on a long, drawn-out one. For example, a 1,000-lb. animal has been known to shrink as much as 100-lbs. on a rail trip. At the current price, that would represent a loss of around \$30, which, if it applied to very many animals in a large shipment, would mean red-ink." Actually, 100-lbs. of shrinkage per animal while in transit is unusual, with the average approaching 25 to 50-lbs. The trucker, incidentally, is responsible for excessive weight losses under ICC regulations. The trucker must also provide bedding for his cargo. Cattle use sand bedding, while sheep,

Garibaldi's big cattle hauling fleet roams over the entire west with one of its key delivery points the Los Angeles Union Stock Yards.

hogs and other livestock need sawdust or wood shavings.

Garibaldi drivers are sent out on student runs before they're given a rig of their own. Student runs, unlike these practice hitches in most of the trucking industry, means more than simply knowing when to make check-stops and how to handle the rig. The student driver must also become familiar, if he isn't already, with the loading procedure, method and schedule for handling livestock. He must know, for instance, that animals must be inspected at every 75-mile check stop. He must also use extreme care on curves—and guard against quick stops. Sudden stops cause cattle to fall, and this could mean that the entire cargo would eventually be bruised, their meat ruined even if they reached market alive. Livestock drivers carry electric-charged prods to urge cattle to their feet. If a particularly large animal has fallen, and can't be prodded to its feet, the driver must set up a barricade—called "paneling down"





--shutting the animal off from the rest of the load. At the same time, loading itself is highly important. Tightly packed cattle tend to fall easily--and getting them back on their feet is a tough job. Since the trucker is responsible for cattle arriving at market or feed lots in poor condition, drivers must inspect each cargo--and note on the billing, before starting off, that the company is not responsible for a sickly or weak animal. This means that drivers, whether they like it or not, have to be judges of cattle as often as they are of motor condition.

Victor Garibaldi is shop superintendent, while his brother, Jimmy, is usually out in the field with the company's various managers, or with the five solicitors who make the rounds of western ranches drumming up business. When the three Garibaldis first began trucking livestock back in 1935, each had a rig, and each drove. They used gasoline-engined trucks then, gradually increased their rigs, and now add 3 to 5 new trucks a year. They were among the first to adopt dieselized rigs in their livestock haulage specialty. From one or two customers in 1935, Garibaldi has grown until today it lists 2500 regular customers--and a west-wide operation.

But it was the advent of the feed lot that really set-up livestock haulers in the west. Instead of hauling cattle directly from range to slaughter house, now there's an in-between-haul--to the feed lot. A typical feed lot, one operated by the big-time farming enterprise, S. A. Camp Co., Shafter, Calif., feeds 11,000 steers in a 90-day "quick-fattening" cycle. Garibaldi's dieselized fleets now pick up range animals from Arizona and New Mexico, haul them to a California feed-lot, then drop back in 90-days to carry the animals to slaughter in either Los Angeles or San Francisco.

All Garibaldi rigs are tachograph-installed, with top speed limit at 55 mph. and then only for passing. Rigs are held to 50 mph. both to maximize diesel engine life and the life and conditions of their animal loads. Just how big a boost livestock haulage has given the diesel truck can be realized by the statistics that for 1950, of the 198,000 head of cattle received at the Los Angeles Union Stock Yard from California points, all but 195 were trucked in. And 99% of those trucks, and practically all of the common carriers, were dieselized.

Maintenance-wise, the brunt of repairs falls to Garibaldi's Los Angeles shops. Rather than rebuild engines, they're replaced by new or factory rebuilt ones about every 280,000-350,000 miles--which figures 2-3 years. About once a year diesel equipment is run into the shops and completely overhauled--that includes rear-ends, transmissions, and front ends.

Garibaldi Bros. also have their own load standard: about 35 head of cattle to a truck-trailer; 300 head of sheep to the same rig. Diesels have replaced the Chisholm trail--and diesels are putting better, more tender, less bruised steaks on the dinner table. As one livestock authority said recently, "Thanks to diesel trucks, cattle are walking less and riding more."



PINK GOLD

By ED DENNIS

SHRIMPING is a million dollar industry in the Fort Myers area, and it promises to be here for many years to come. Just a couple of years ago the area was just a tourist resort with fishing and shrimping secondary, and only one or two fishing firms. Then came the startling news that a new and fabulous shrimp bed had been discovered by Felix Salavador of the S. Salavador Shrimp Fleet, northeast of Dry Tortugas, and shrimpers flocked to this area from as far north as the Carolinas and as far west as Texas.

The Tortugas strike started the ball rolling and brought shrimp boats into the Florida waters. Within a month or two over 300 vessels were operating, and over 2 million lbs. of shrimp a month were coming into local ports. Gradually but surely the boats found their way to the Fort Myers area and soon it was to become one of the important shrimp packing ports of Florida with about 175 boats operating there.

Then, in the early part of '51 rumors of new and larger grounds off the Yucatan peninsula of Mexico were heard. These came to be known as the Campeche Beds. But the rumors were unfounded until Capt. Sam Vona of the heavy trawler *Vona Mabry* came alongside the Dixie Fish Co. dock with a record load of over 10,000 lbs. of this "Pink Gold," and a new bed of "Pinkies" was discovered. It was a bonanza haul, and other owners made ready for the trip to the Campeche Beds. This required increased fuel and ice capacity being built into the trawlers, more marine supplies, more grub, and the diesels had to be in top shape for the 1400 mile round trip to the Campeche grounds plus 7 or 8 days of trawling.

Often times the boats run into rough weather en route, especially during the hurricane season. Last year 18 year old Capt. John Bothwell, in the 60 ft. *Suzanna* rode out a "cane" with his Caterpillar engine going full speed ahead for over 12 hours with the winds better than 100 miles an hour, and they returned undamaged to Fort Myers Beach with 7,500 lbs. of shrimp. And the time Capt. Sallas

sailed his faithful *Blue Bell* into a howling tropical storm to save the lives of the crew of the sinking *Virginia May*, and the first thing he said upon returning was, "that Lathrop sure can take it."

This new booming industry represents several million dollars in boats, packing houses, and other facilities; and it requires the most modern icing and fueling equipment along with marine supplies, plus a quick and efficient service on the diesel engines. Consequently General Motors, Caterpillar and other firms have opened service branches in this area.

About two dozen operators work out of Fort Myers and Fort Myers Beach. Some have only one or two vessels and others have a dozen or more. Among this colorful fleet you can see such veterans as *Miss Columbia* and *Blue Bell* with their Lathrops, the *Capt. Kid* and *Queen Mary* with G.M.'s, the *Boxer* and *Big Chief* with D-13000 Cats, the *Pink Gold* with a Murphy Diesel, the *Viking* with her Sterling Vikings, and there are plenty more as the fleet is spread out for almost 20 miles along the Caloosahatchee River from the city to the beach. This famous river gains its name from Don Carlos, mad son of Phillip II of Spain. The Caloosa was originally Carlos, but later, when joined to the Indian word "hatchee" meaning river, became the Caloosahatchee.

One of the more farsighted men in the industry is Dr. J. Townly, a retired New York physician, who is part owner of Gulfpac. This firm operates about 8 trawlers and 2 freeze ships. These freeze ships are an engineer's dream as they have 6 or 7 diesels on each vessel, plus refrigeration compressors, light plants and huge freezing compartments where freshly caught shrimp are packed in 5 lb. boxes and frozen. These 5 lb. boxes of frozen shrimp are transferred to refrigerated semi-trailers at the dock for shipment to all parts of the East.

The shrimp are caught in large nets that cost up to \$400 each. The boats first let down a trial net to see if they are in good shrimp territory, then

The *Captain Scotty* of Brownsville, Texas equipped with a G.M. 6-71, built and engineered by Diesel Engine Sales of St. Augustine, is one of the more modern trawlers.



over go the giant nets to be towed for miles by steel cables. These cables are usually controlled by a deck winch. The packing houses have modern conveyor systems to facilitate transfer of the cargo once the trawlers have tied up along the dock. The shrimp are then mixed with snow ice and the masses of shrimp and ice are loaded into baskets and dumped into large vats of water. The ice floats to the top, and the shrimp sink to the bottom where a conveyor belt brings them up and across



The *Rambler* is a 67x18 Tams design shrimp trawler owned by Marvin Hardie of Morgan City, La., powered with a D-13000 Cat., built by Diesel Engine Sales Co., Inc., St. Augustine.

a picking table. From there 103 lbs. go into a scoop suspended from a scale, then into boxes where they are packed with layers of ice.

The Lee County Chamber of Commerce said, "Without hesitation we acknowledge that this new industry has added spark to our economic life stream and bolstered just about every business in this area, and we would like to pay a sincere tribute

to the producers and workers of this great industry. We hope to encourage a greater traffic and further expansion here in this most lucrative industry." The Marine Laboratory of the University of Miami states, "There is probably no reason to fear a sudden collapse of the fishery as so much of the area is protected from fishing gear by coral that a natural brake is applied, and furthermore the shrimp is essentially an annual crop."

The trawlers that are being built now are heavy duty for long range shrimping as there are rumors of new beds off the South American Coast.

We wish to acknowledge the sincere help of the Marine Laboratory of the University of Miami in supplying the authentic fishing material used in this article and to congratulate them on the splendid work they are doing for the fishing industry.

ESTHERVILLE, IOWA

By RUSSELL PETERSON*

IN less than five years, the City of Estherville, Iowa, has added 6,216 hp. to its municipal power plant, bringing total capacity to 11,391 hp. The additions have been carefully planned to provide maximum economy with gas-burning engines and at the same time to keep a plant that can operate efficiently on oil if gas supplies are curtailed. The latest engine, put into service in January 1950, is a 3200 hp. Nordberg dual-fuel engine which, operating on natural gas, combines the fuel efficiency of the builder's mechanical-injection diesel with the equally notable economy of the high pressure gas engine. It is a two-cycle, trunk piston, mechanical-injection engine of eight cylinders, 21½ in. bore and 29 in. stroke, which develops its rated horsepower at 225 rpm. Driven by the engine is a separate three-stage compressor which compresses the natural gas to 1175 lb. The high-pressure gas goes through an after-cooler to a header and into the cylinders through admission valves controlled by hydraulic actuator pumps. Mounted on the compressor unit is a separate set of fuel injection pumps which deliver a precisely-metered charge of pilot oil to initiate combustion of the gas. The engine can be converted readily to full oil operation with the regular large-volume injection pumps handling the fuel.

Operating as an oil engine for 256 hours in its first month of service, the new engine produced 374,500 kwh. on 27,443 gal. of fuel, an average of 13.64 kwh. per gal. at about 60 per cent load. Switched over to gas, the unit ran 3,911 hours in the next seven months, generating 6,416,800 kwh. Gas consumed was 73,624 mcf., an average of 11.47 cu. ft. per kwh. and pilot oil totaled 26,810 gal. or .0042 gal. per kwh. With gas at \$.20 per mcf. and oil at \$.11 a gal., the gas cost per kwh. was 2.28 mills, oil cost 0.46 mills, a total fuel cost of 2.74 mills per kwh. It is evident that pilot oil consumption is particularly low, for oil contributes actually only 4.6 per cent of the heat.

Estherville has produced its own power since 1893, when a small steam plant was put in service. First internal-combustion engine was a 225 hp. Busch-Sulzer air-injection diesel, installed in 1915, followed by a similar 250 hp. unit in 1920. Presently in service are a 500 hp. air-injection Busch-Sulzer diesel installed in 1924, a similar 600 hp. unit installed in 1929, a 750 hp. Worthington diesel put to work in 1935, a 1,285 hp. mechanical-injection Busch-Sulzer engine installed in 1938, and a 2040 hp. Busch-Sulzer diesel installed in 1940. It was at this point that the city turned to natural gas as a means of counteracting the rising price of fuel oil. First step was to convert the 750 hp. unit to a straight gas engine. The five engines listed above carried the load throughout the war. Then, in 1945, as soon as engines became available, Estherville ordered a 2400 hp. Nordberg dual-fuel diesel engine. Put on the line midway through the 1946 fiscal year, this engine was subjected to a heavy operating schedule. In approxi-

mately three and a half years, it ran 25,908 hours and generated 31,027,100 kwh. Of this total 1,087,300 kwh. were produced as an oil-burning diesel and 29,939,800 kwh. on gas and pilot fuel.

Fuel consumed in generating the 29,939,800 kwh. consisted of 399,492 mcf. of natural gas and 117,318 gal. of pilot oil. This means an average of 11.33 cu. ft. of gas and .0039 gal. of pilot oil per kwh. In terms of cost, figuring gas at \$.20 and oil at \$.11, the engine produced its power for a total fuel cost of just 2.69 mills per kwh. If we figure the fuel cost per kwh. generated by the plant's oil-burning engines (which average 13 kwh. per gal. of fuel), we find a cost of 8.46 mills compared with the 2,400 hp. unit's 2.69 mills. The fuel saving of 5.77 mills per kwh., multiplied by the 29,939,800 kwh. produced by the gas engine in three and a half years, represents a total saving of \$172,752.65.

Even the 2400 hp. engine could not match the phenomenal expansion of the load. The city itself was growing rapidly, reaching a population of 6,750 in the 1950 census. People began to use more electric appliances. Industry was attracted by good living conditions and lower power rates. Today the power plant serves two meat packing plants, two feed-processing mills, two creameries, a poultry processing plant, and a nylon fish line factory. Estherville is the trading center for a large prosperous area and commercial use of power is high. Lastly, the REA, cooperative served by the city's plant shot transmission lines far afield and asked for more and more electricity, finally contracting for a minimum of 7,000,000 kwh. a year with a maximum peak of 2,500 kw. An analysis of power distribution in August 1950 shows how the various users divide the plant's production: REA., 35%; Commercial, 33%; Industrial, 12%; Residential, 11%; Line loss, 6%; City use, 3%. The REA. and large industrial consumers purchase power at the switchboard and absorb line losses. As a result of this general expansion of demand, the city found itself in a squeeze in 1948. Every prime mover in the plant was needed to carry the peaks and the heaviest seasonal demand was still ahead. To meet this emergency the city was fortunately able to secure a 616 hp. four-cycle Enterprise dual-fuel engine.

The city then proceeded with plans for another major plant expansion. With the load curve still rising, the city ordered the 3200 hp. Nordberg engine on April 1, 1949. It was put in service on January 7, 1950, nine months and a week later. Table I shows how the load and production have grown in the past 11 years. It will be seen that kilowatt-hour production in the fiscal year ending April 1, 1941 was 6,969,900. In the 1951 fiscal year, production was 26,190,700 kwh. During the same period peak loads rose from 1,950 kw. to 5,850 kw. With each year, the percentage produced by the gas engines has increased substantially. In the 1951 fiscal year, the gas burning units generated 21,307,100 kwh. compared with 4,883,600 for the oil engines. Yet, oil plays an important part. When the temperature goes below zero, a not uncommon occurrence in Iowa, the plant's gas supply is shut off and the Busch-Sulzer engines carry the base load. The gas company has usually provided enough gas to run the gas units during peak load periods and it is rarely considered necessary to switch the gas-burning units to oil.

The 1950 fiscal year included only three months with the 3,200 hp. engine in operation and a much higher contribution in 1950-51 resulted in a lower average fuel cost. The plant average in 1950 was 4.36 mills per kwh. compared with the big gas unit's record of 2.74 mills. Estherville officials feel the plant renders greatest service when it is producing high volume at low consumer rates. Twenty years ago, output was small and rates were comparatively high. Income per kwh. was 5.07 cents and total department expense 2.6 cents. In contrast, the 1950 income was 1.87 cents per kwh. and department expenditures 1.04 cents. In spite of the diminution of unit profit margin, the plant's profits grow greater every year. The plant's operating statement for the year ending March 31, 1951 shows the following operating expenditures for the 1949, 1950 and 1951 fiscal years, the margin of profit and the allocation of profit. Operating revenue in 1951 amounted to \$455,469.67. Plant operation consumed \$143,533.22 with an additional \$27,636.89 for maintenance, distribution took \$40,090.78, the meter department \$3,573.69, and the business office \$21,400.99 for a total operating expense of \$236,255.57. This left an operating profit of \$219,214.10. The department transferred \$35,000.00 to the city general fund, \$43,203.02 to the electric light sinking fund, and \$134,000.00 to the bond retirement fund.

TABLE I
Ten-year Record of Plant Load and Production

| Year Ending April 1 | Total KWH. Produced | Peak Load | Gal. Fuel Oil | Total Gas MCF. |
|------------------------|------------------------|-----------|------------------|-------------------|
| 1941 | 6,969,900 | 1950 | 488,500 | 11,165 |
| 1942 | 7,201,500 | 1710 | 413,500 | 29,416 |
| 1943 | 7,348,500 | 1710 | 441,045 | 30,154 |
| 1944 | 8,356,100 | 1950 | 453,750 | 38,965 |
| 1945 | 9,333,800 | 2080 | 515,950 | 43,258 |
| 1946 | 10,708,400 | 2800 | 575,235 | 43,627 |
| 1947 | 13,673,300 | 3600 | 741,388 | 50,452 |
| 1948 | 17,858,400 | 4450 | 521,115 | 129,093 |
| 1949 | 21,168,500 | 4900 | 568,083 | 160,410 |
| 1950 | 22,846,400 | 4950 | 507,190 | 190,093 |
| 1951 | 26,190,700 | 5850 | 450,369 | 246,184 |

*Superintendent of Public Works

List of Equipment

Engine—One eight cylinder, 21½ in. x 29 in. two-cycle, 3200 hp. dualfuel diesel engine operating at 225 rpm. Nordberg Manufacturing Co.

Generator—The Elliott Co.

Blower—The Elliott Co.

Governor—Woodward Governor Co.

Natural gas—Peoples Natural Gas Co.

Gas compressor—Nordberg Mfg. Co.

Actuator pumps—American Bosch Co.

Fuel pumps—American Bosch Co.

Lube oil—P-40 in cylinders; Algol in crankcase;

Texaco. The Texas Co.

Purifier—U. S. Hoffman.

Fuel filters—Wm. W. Nugent.

Oil cooler—Struthers-Wells Corp.

Lube oil pumps—De Laval Steam Turbine Co.

Jacket water pumps—Allis-Chalmers Mfg. Co.

Cooling tower—J. F. Pritchard & Co.

Raw water pumps—Two Gardner-Denver Co. and one Allis-Chalmers Mfg. Co.

Compressors—Two Worthington Corp. and one Quincy Compressor Co.

Air filters—American Air Filter Co.

Exhaust silencer—Maxim Silencer Co.

Cylinder lubricators—Manzel, Inc.

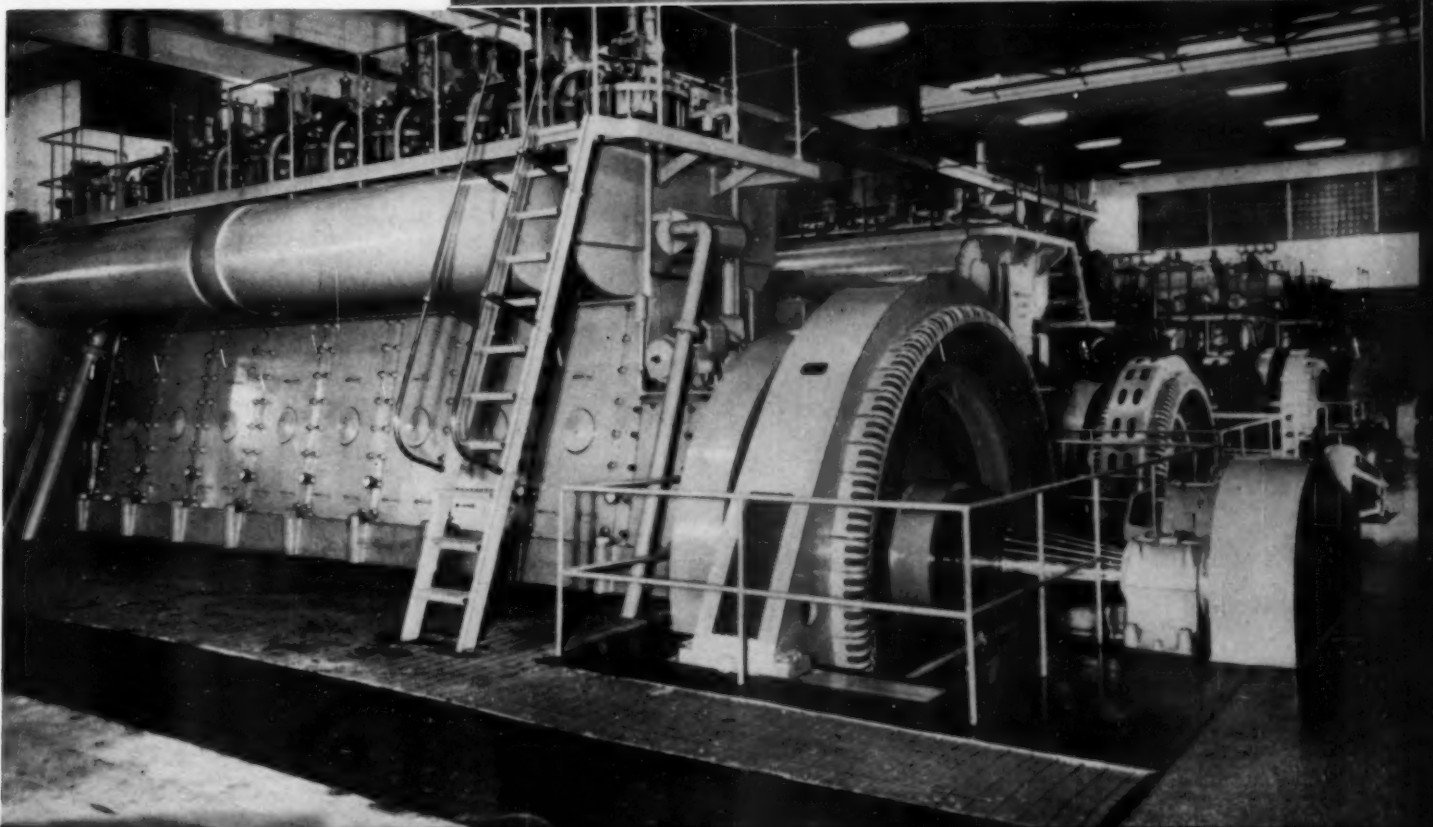
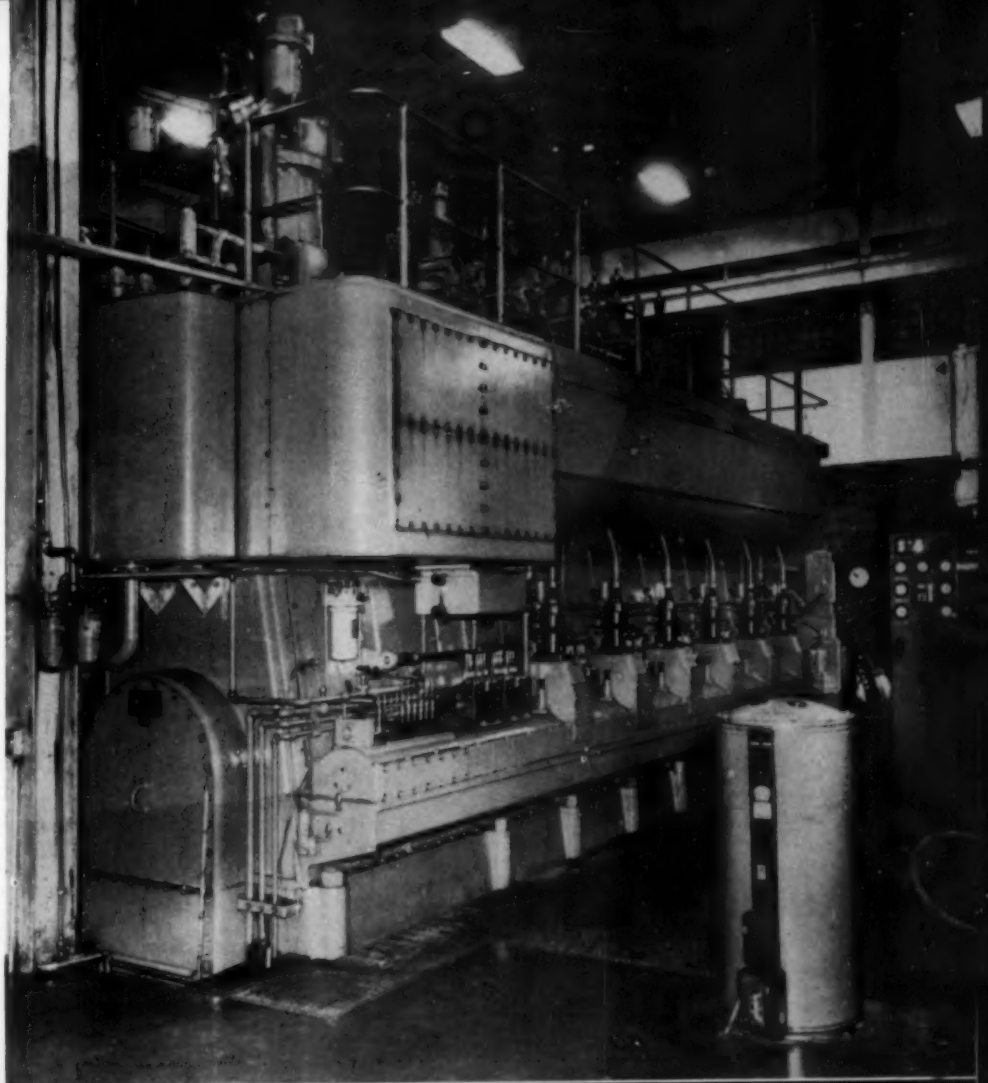
Pyrometer—Alnor. Illinois Testing Lab.

Alarm system—Viking Instruments, Inc.

Switchboard—General Electric Co.

This 2400 hp. Nordberg Dualfuel engine operating on natural gas has generated more than 21,000,000 kwh. in less than four years at an average fuel cost of 2.69 mills per kwh. Pilot oil averaged 4.4%. Note Honan-Crane oil purifier in foreground; Nugent filter on engine; Manzel lubricator on engine; Bosch pumps and Alnor pyrometer on control board.

This view shows seven of the eight engines. In the foreground are the two Nordberg convertible gas engines which produce power for a total fuel cost under 2.75 mills per kwh. Not shown is the 616 hp. Enterprise dual-fuel unit.





THE toughest job in the world for prime movers is the rock plant. Here is endless punishment traveling on endless rock-loaded belts. Clouds of rock-laden dust never settle. Air-hungry diesels gulp abrasive air and hurry more endless belts around to make more rock dust—that's the engine-killing cycle in the rock crushing plant. Under such conditions diesels have faced up to the job and won on every count—more horsepower per dollar, longer life, ability to operate efficiently under toughest conditions, to say nothing of reliability where down time might cost \$100 a minute.

General operating conditions at the large plant of the Samuel Kraus Company, at Auxvasse, Mo., are no better and no worse for engines, except that diesels are working side-by-side with "bought" electric power and are winning that battle both on the score of economy and maintenance. Electric motor maintenance is high in a rock plant because unlike the diesel engine it has no air filter and too much shielding causes excessive heating. Even though an engine must breathe the air heavily loaded with abrasive dust, efficient service and adequately maintained air cleaners, can reduce the hazard.

But there are distinct advantages in the use of electric power in certain locations in a rock plant, John Kraus, general superintendent, pointed out to the DIESEL PROGRESS representative. Small motors may be perched atop elevators and conveyors to put the power close to the job where the location would be impractical for engines. The solution, Kraus pointed out, which other rock plant operators have found also, is electric operation where it is best from power supplied from the plant's own diesel electric generators—not "bought" power with high demand rates based on horsepower.

The limestone beds at this site have been mined for 75 years. In the early days lime for mortar was made by hand labor and supplied to lumber yards. Later lime rock was mined by the vertical shaft method, tunnels and drifts and crushers were operated by horses. The old underground workings representing several acres are now used by the present owners for the winter storage of surplus machinery since it has a constant temperature of 55 degrees.

The Samuel Kraus Company, of which Samuel Kraus is president, is a well known construction company with headquarters in St. Louis. It does an extensive business in road building, excavating and general construction and owns hundreds of units with diesel engines. The rock quarry operation is an important department. It sells crushed rock in all sizes. The Kraus organization has owned the Auxvasse quarry for seven years and has had an expansion program underway since that time to

Above: loading rock into a GMC diesel powered Euclid 15-ton dump truck which hauls to mill in background up the steep road at left. Power shovel is a Lima with Cummins diesel. Main plant top left.

General view of plant from stock piling area.

TOUGHEST JOB GOES TO DIESELS

By L. H. HOUCK

increase production to supply the heavy demand.

A new hammermill is now under construction at the site to increase the present capacity of the plant which is 100 tons per hour. Higher future production has been planned in the installation of the large Caterpillar powered jaw crusher which at an 8-inch setting has a capacity of 340 to 500 tons per hour.

The biggest, toughest and most important job in the mill is handled by a diesel—an almost new D-17000, which produces 160 hp. at 1000 rpm. The engine is conventionally cooled with radiator and fan and is mounted on steel skids now permanently located on a concrete base in a nook back of crusher and over the crusher's output conveyor. It is connected to the crusher with 8 V-belts. The D-17000 is a well known power unit in use the world over. It is an 8 cylinder V type with four cylinders in each bank. It runs counter clockwise and has a stroke of 8 inches and a bore of 5½ inches.

Specifications of the giant Pioneer crusher, largest manufactured by that company, are interesting. It can crush a rock 5 feet long, nearly 4 feet wide and more than 3 feet thick—theoretically at least, although economic crusher operation depends on crushing the largest rock the power shovel dipper can load. Crusher jaws are 42 inches wide, 60 inches deep. The jaws operate on an eccentric turning at 250 rpm. with a 1½-inch stroke. Dump trucks dump to a traveling grizzly powered by crusher by endless chain, with bars spaced at 2 inches. Rock smaller than 2 inches drops to a conveyor beneath the grizzly which bypasses the crusher. The larger material passes through the crusher which is fed by the grizzly. Crusher flywheel is 50 inches in diameter and 14 inches wide. Crusher weighs 39,600 pounds.

Although the diesel driving the crusher occupies a key position, there are dozens of other diesels on the job with equally important jobs. The old axiom about the chain with the weakest link applies particularly well here where one weak link can stop the whole chain of work. As Mr. Kraus, general superintendent, explained, every phase of the complex operation must be timed and keyed to production in relation to every other phase. The routine starts with stripping overburden so that limestone beds will be bared in time for the dynamiting and drilling crews. This crew must keep enough rock blasted loose to keep power shovels busy loading trucks which haul the rocks to the mill. In this chain the reliability of diesels and their ability to "stand the gaff" comes in good stead.

Maintenance schedules are just as precise as the production schedules. A fully manned and equipped shop is kept for engine repair and service as well as general service and repair. Drivers can pull out of line for an oil check, oil drain or quick filter element change. These services are regularly performed when needed in a matter of minutes by two-man crews. Truck service and stationary diesel service, goes on constantly during

the regular day working hours instead of being handled at night when the plant is idle. Some complete overhauls may be handled at night but 90 per cent of the mechanical work takes place during the regular working hours which are 8 in winter and 10 in summer.

There are a number of advantages to servicing equipment during working hours, Mr. Kraus pointed out. Better service can be performed on engines at working temperatures, particularly in oil draining and filter changing. Valves on overhead jobs are quickly adjusted for proper lash because they are hot. Drivers and the maintenance department can keep a close check on a service or a repair job under actual working conditions. The secret back of the splendid upkeep record in this engine-killing atmosphere is the attention given precleaners and air cleaners. Both are serviced each 48 hours. "More than 90 per cent of the wear on an engine can be eliminated by adequate servicing of air cleaners and making sure all the air the engine breathes is filtered of rock dust," John Kraus, superintendent, said.

Oil is changed on inspection rather than hours or mileage. Filter cartridges are changed often enough to keep the oil clean. Conditions vary from day to day. Some days the dust may be heavier because the mill is producing rock ground to the consistency of fine flour for farmers using ag lime on their fields. There is less dust when the mill is producing aggregates but there is also the fact to be considered that the mill at times produces all these products at the same time. Consequently service is regulated to the need instead of being tied to arbitrary mileage and hours. Upkeep cost,

Kraus said, is but slightly higher than for conventional jobs.

Here are some of the other diesel units which keep the rock rolling to the crusher. Rock blasted out at the bottom of the quarry, now 200 feet deep and connected to the top by two steep roads, is sped to the crusher by two Euclid 15-ton dump trucks powered with GMC 2-cycle Series 71 6 cylinder diesels. Two other hauling units are two 14-yard capacity trailer type "Euc's" powered with Cummins diesels. Three power shovels load these trucks for their clock-like shuttle trips. Two are 1½-yard Limas with Cummins and the other is a 1-yard Lima with a Buda. A 1-yard dragline with Buda loads lighter material and works on overburden. The rock quarry routine is drill, blast, load.

Blasting off 20-ft. deep sections of the bench is accomplished by drilling holes with a Joy drill using 1¾-inch drills 20 feet or more long for dynamite charges. The drill unit is a self-contained unit mounted on a truck and consists of a Sullivan air compressor direct connected to a Hercules diesel. The final stage of production is delivery to the customer. While some of the finished product is stored in large bins which are unloaded into trucks by gravity, a great deal of the large capacity is dumped on flat loading areas. These stock piles are loaded into consumer trucks by high lifts.

For this purpose they have a Caterpillar D-4 high lift and two one-yard Hough Payloader highlifts with International diesels. A D-8 Caterpillar with bulldozer blade helps with stockpiling and another D-8 is used to pull a LeTourneau cable scraper in the burden stripping job down in the quarry.

Another Hough Payloader with International diesel engine loads a yard of gravel into a truck at each bite.



CRETE, NEBRASKA

Municipal Power Plant Yields 43% Net Profit by Using Dual Fuel Engines

By WILLIAM H. GOTTLIEB

THE conversion in August, 1950 of a 1600-hp. Fairbanks-Morse Model 33F16 diesel at Crete, Nebraska, to dual fuel operation has resulted in a fuel savings of over \$25,000 during its first year of operation. Use of cheaper natural gas rather than all diesel fuel has resulted in such marked savings that an additional F-M 33FD16, 1200-hp. dual fuel engine has been purchased and installed. This new unit was started for the first time in December, 1951, and shortly began delivering additional low cost power. In the first 12 months after conversion the 1600-hp. engine ran 8,703 hours, more than 99.3 percent of the time and produced 6,135,900 kwh.

Crete's municipal power plant, built in 1928, now has four units—all Fairbanks-Morse. The two older, smaller diesels, now used for emergency service only, are a 360-hp., 6-cylinder, Model VA, and a 600-hp., 4-cylinder, Model 33D16. These two engines are still in good condition and were used regularly for peak loads in the past year. The converted unit is a 1600-hp., 8-cylinder, Model 33F16 engine of 16-in. bore and 20-in. stroke operating at 300 rpm. It drives an 1125 kw., 2400 volt F-M alternator with a 20 kw. direct-connected dc. field exciter. This unit was installed in April, 1947, and converted to dual fuel operation in August, 1950. Newest unit is a 1200-hp., 7-cylinder, Model 33FD16 of 16-in. bore and 20-in. stroke, 257 rpm., F-M dual fuel engine driving a previously acquired 725 kw., 2400 volt, F-M alternator with a 15 kw. direct-connected dc. field exciter. Both dual fuel engines are similar in construction and in auxiliaries. Of the total installed capacity of 3760 hp. and 2500 kw., 2800 hp. are dual fuel and 960 hp. are diesel. The dual fuel engines will carry all of the present load.

The dual fuel engines are capable of straight diesel fuel operation and in event of gas failure will immediately and automatically switch to oil without loss of load. The natural gas does not ignite after compression so a small quantity of fuel oil is injected to cause combustion. Pilot fuel for dual fuel operation is the same as that used for diesel operation but is supplied to the cylinder by separate pilot fuel injection pumps. The 28° API diesel fuel is purchased in tank car lots and stored in steel tanks of 190,000 gal. total capacity. The oil is pumped to the individual 300 gal. day tanks and is metered to each engine. Duplex pressure fuel oil filters insure clean oil to the injection pumps. Current fuel oil cost is 11.15 cents per gallon delivered.

Natural gas with high heating value of slightly

over 1000 btu. per cu. ft. is supplied to the plant at 32 psi. The flow to each engine is measured by a displacement-type gas meter. Gas pressure is reduced to 22 psi. before reaching the intake valves on the engine. Current gas rates are about 28 cents per 1000 cu. ft., on a high priority interruptible contract. Service was stopped for one day during the first month of this winter's operation. Fuel cost on the converted dual fuel unit amounts to 4.62 mills per kwh. compared to 8.8 mills per kwh. on the diesel engines. Both figures are based on present fuel prices. The saving of 4.18 mills per kwh. represents a big 47.5 percent reduction in expenditures for fuel. With this one engine alone generating 6,135,900 kwh. in a year, the fuel savings were in excess of \$25,000.00. Monthly figures on savings for dual fuel over diesel operation are shown in Table I.

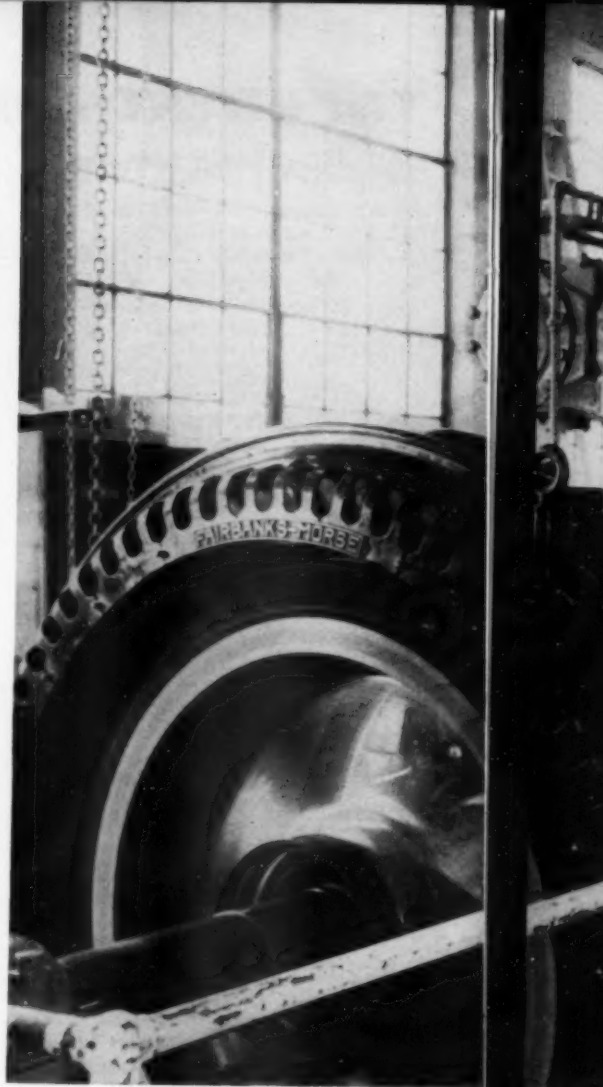
Dual fuel operation has resulted in a marked improvement in lubricating oil condition and consumption compared with the same engine on diesel fuel. The same lubricating oil is used in force-feed cylinder lubricators and in the engine crankcase. Full pressure oil system in the crankcase lubricates the bearings and cools the pistons. The oil is put through a shell-and-tube type cooler and an oil filter before returning to the engine. A closed cooling water system is used on all engines. Any makeup water required is treated to decrease hardness. Motor-driven centrifugal pumps circulate the soft water through the engine jackets, then to an evaporative-type water cooler. A new forced-draft cooling tower is now being installed to increase the cooling capacity. The jacket water will be cooled inside tube banks which are exposed to the cooling tower water spray.

All intake air is filtered before use by the engine. Scavenging air blower is direct-driven from the engine crankshaft. Exhaust gas silencers are used on all engines and do an effective job. Even though the plant is located in the downtown area there is no noise problem. Starting air for the engines is supplied by a motor-driven air compressor. A gasoline engine-driven compressor is available for emergency operation.

A compact control panel is located near each engine. Lube oil pressure, water pressure and temperature, scavenging air pressure, gas pressure, and multiple point exhaust pyrometer readings are indicated. There are signal lights to show that jacket water pump, raw water pump and lube oil pump are operating. Alarm signals are set for oil pressure, water temperature, and water pressure.

Electric generation and distribution is at 2400 volts with plant auxiliaries handled through transformers at 110-220 volts. The plant supplied power and lights to the city of Crete and part of the load for the REA lines in the county. The plant is not interconnected with an electric transmission grid and has maintained a very good service record. Present peak load is about 1800 kilowatts. The electric demand has been increasing at a very high rate—124 percent increase in the past five years. Mr. C. R. Weaver, Commissioner, and Mr. Leonard Stewart, Plant Engineer, are looking ahead and making plans to provide for further load increases.

Basically Crete is a trading center for an agricultural community but its business and industries are varied. Included are Doane College, grain mills, dairy products' processing and manufacture, concrete products, and voting equipment manufacture. The 1950 population was 3700. The Municipal Plant is a profitable enterprise returning a net profit to the city of 43 percent on electric sales. Electric rates are maintained at less than the national average. Crete is looking forward to greater earnings with the increase in the load carried by its dual fuel engine.



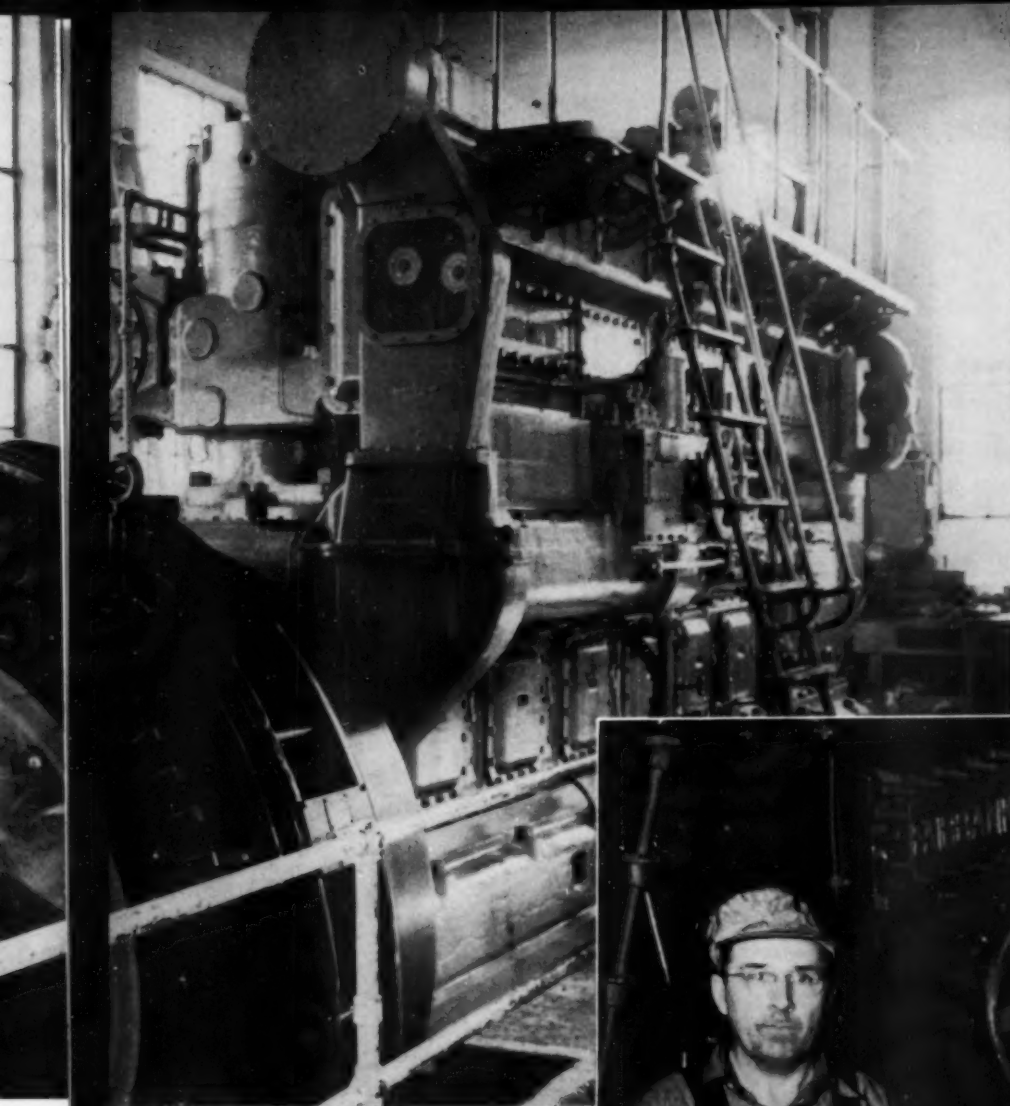
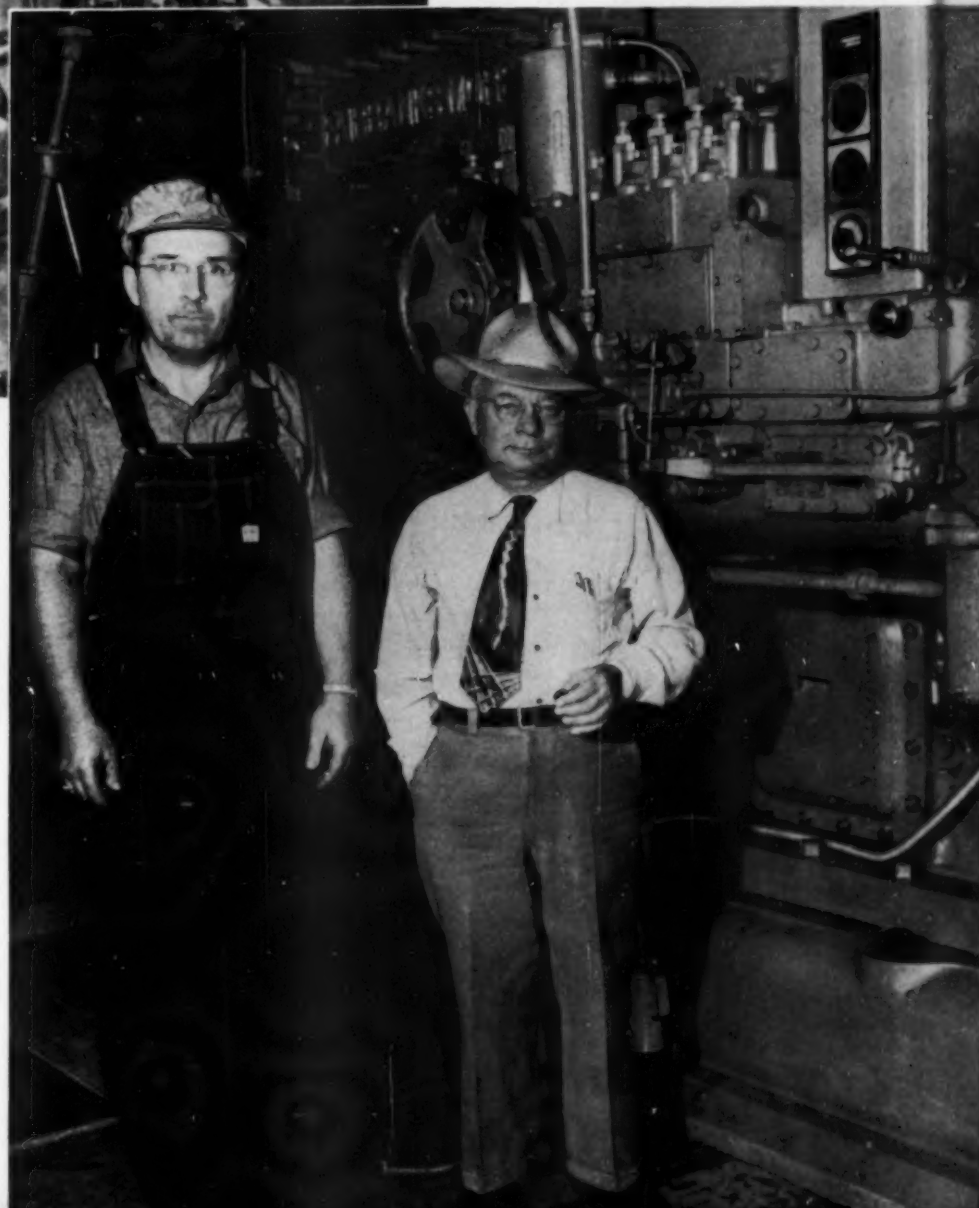


TABLE I
Operating Statistics on Model 33FD16, 1600-hp.
Converted Dual-Fuel F-M Unit at Crete, Nebraska

| | Kwh. | Hours | Savings over Oil |
|--------|-----------|-------|---------------------|
| 1950 | | | |
| Sept. | 481,000 | 714 | \$ 2,250.00 |
| Oct. | 496,000 | 742.1 | 1,960.00 |
| Nov. | 497,200 | 717.5 | 2,140.00 |
| Dec. | 522,200 | 742 | 1,520.00 |
| 1951 | | | |
| Jan. | 416,200 | 742 | 1,320.00 |
| Feb. | 505,000 | 669 | 2,360.00 |
| March | 581,000 | 739.6 | 2,810.00 |
| April | 522,400 | 712 | 1,860.00 |
| May | 526,400 | 742 | 2,320.00 |
| June | 483,700 | 707 | 1,880.00 |
| July | 552,800 | 740.5 | 2,430.00 |
| Aug. | 552,000 | 735.3 | 2,410.00 |
| Totals | 6,135,900 | 8,703 | \$25,260.00 |

In December, 1951, Crete installed additional dual-fuel capacity with this 1200-hp., 7-cylinder, Model 33D16 F-M engine.

Plant Engineer Leonard Stewart (left) and C. R. Weaver, Commissioner, stand by the controls of the new 1200-hp. Fairbanks-Morse dual fuel engine.



List of Equipment

Engines—One 1600-hp., 8-cylinder, 16 x 20-in., 2-cycle, 300 rpm., Model 33FD16, converted dual fuel diesel. One 1200-hp., 7-cylinder, 16 x 20-in., 257 rpm., Model 33FD16 dual fuel engine. One 600-hp., 4-cylinder, Model 33D16 diesel. One 360-hp., 6-cylinder, Model VA diesel. Fairbanks, Morse & Co.

Alternator—One 1125-kw., 3-phase, 2400 volt, Type TGZO, alterator. Fairbanks, Morse & Co.

Governor—Woodward Governor Co.

Fuel filter—Wm. W. Nugent & Co.

Fuel oil—28° API. Diesel Service Co.

Natural gas—Northern Natural Gas Co.

Gas meter—Pittsburgh Equitable Meter Co.

Lube oil—VACME #3. Socony-Vacuum Oil Co.

Oil strainer—Purolator Products, Inc.

Oil purifier—Hilco Hyflow. Hilliard.

Evaporative water cooler—Fairbanks, Morse & Co.

Water pumps—Fairbanks, Morse & Co.

Oil pumps—Fairbanks, Morse & Co.

Air filter—American Air Filter Co.

Exhaust silencer—Maxim Silencer Co.

Pyrometer—Alnor. Illinois Testing Labs.

Switch gear—General Electric Co.

Cooling tower—Diesel Service Co.



During trials, the *Brynn Foss*, owned and operated by Foss Launch & Tug Company of Tacoma, achieved a speed of 12 mph. running free.

**Nordberg Supairthermal Engine Propels
Powerful New 72-ft. West Coast Tugboat**

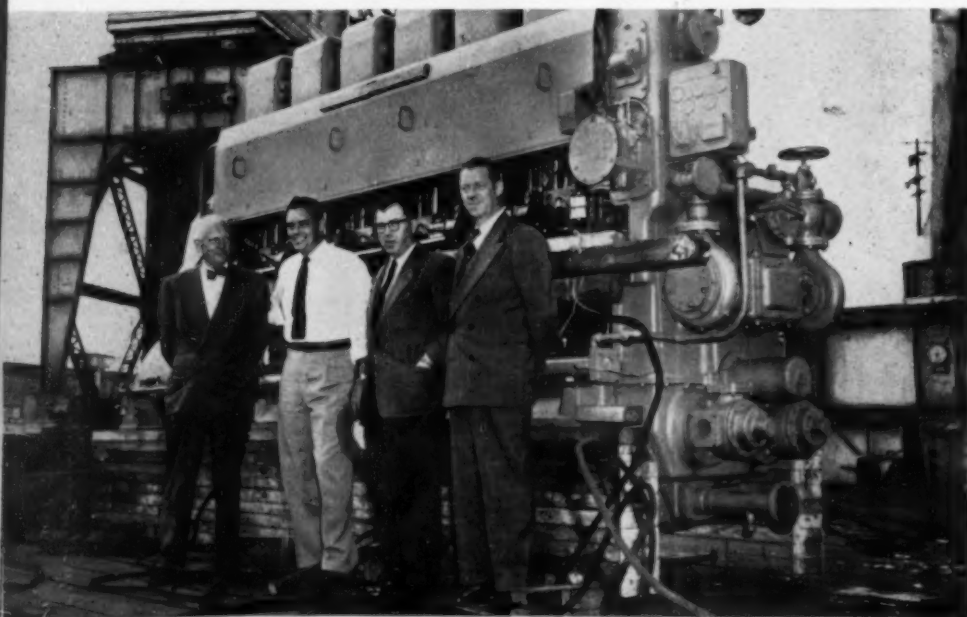
"BRYNN FOSS"

By DWIGHT P. ROBISON

LAATEST addition to the fleet of harbor and coastwise vessels owned and operated by Foss Launch & Tug Company, Tacoma, Washington, is the *Brynn Foss*, a new 72-ft. tugboat powered by an 800 hp. Nordberg direct drive, direct reversing Supairthermal diesel engine. The *Brynn*, one of the most powerful tugs of its size in the world, completed her extensive trials in late January and is

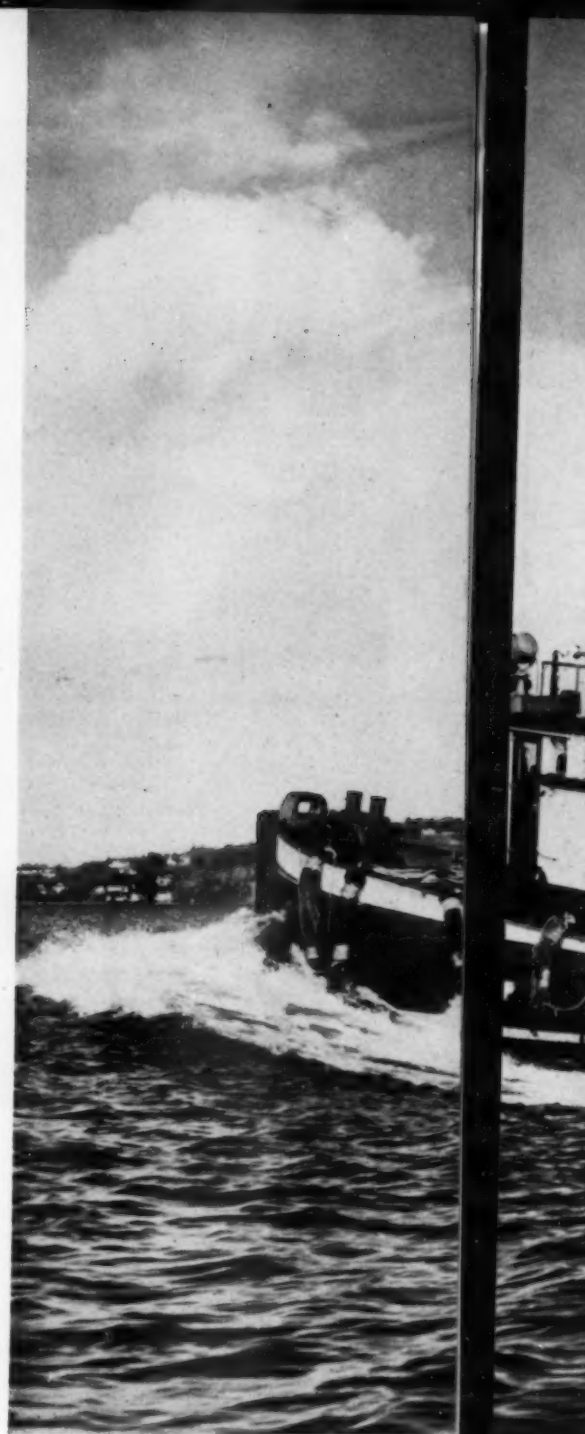
now plying her power in Tacoma Harbor on a "round the clock" schedule. The new tug was designed by H. C. Hanson, Seattle naval architect and the hull was constructed by Reliable Welding Works, Olympia, Washington. Complete outfitting and engine installation was performed by the Foss repair plant at Tacoma. Built for general harbor work including the docking of big ships, the *Brynn*

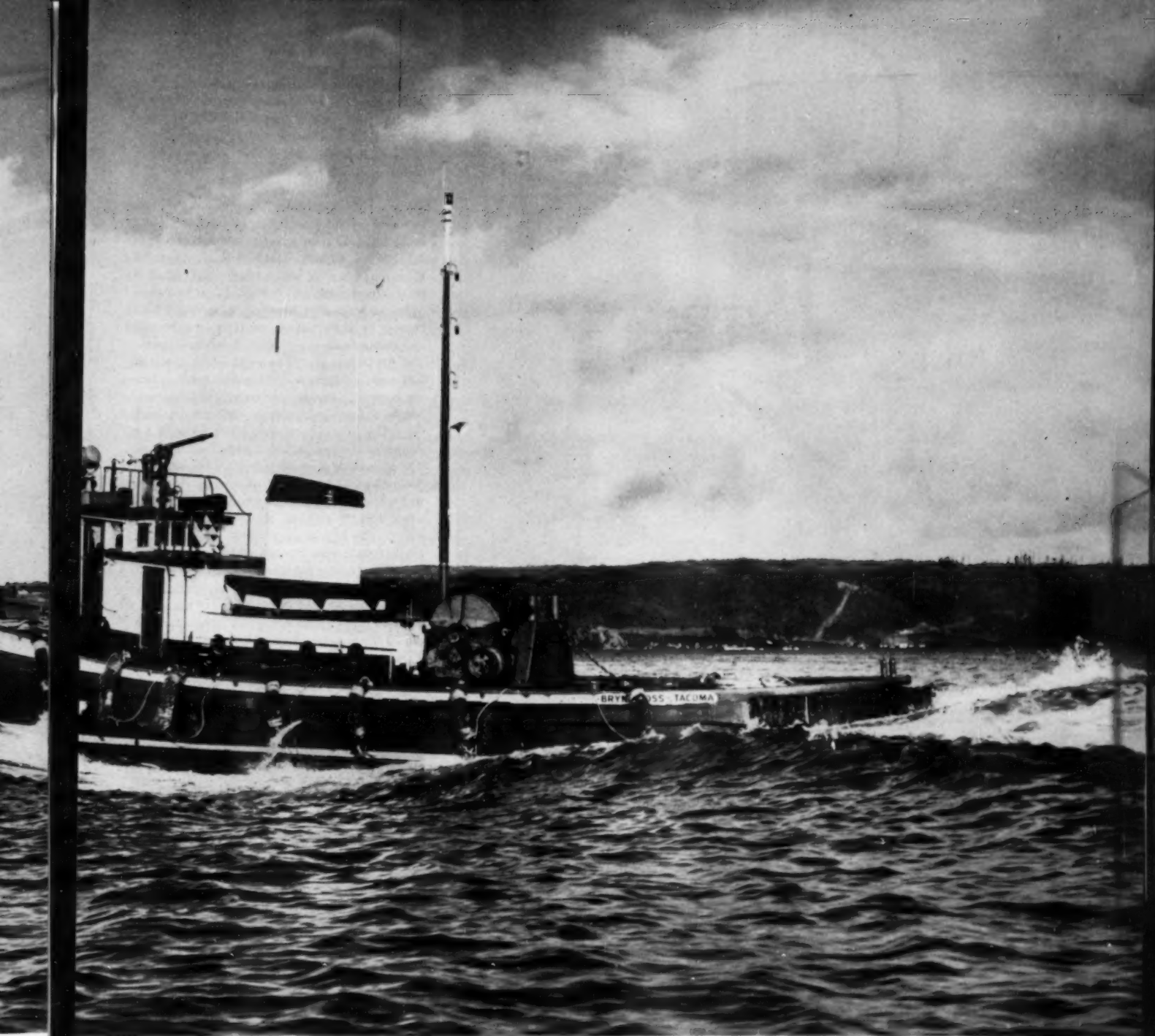
Officials from Foss Launch & Tug Company and Nordberg were present during the installation of the engine in the *Brynn*. Shown from left are: Henry Foss, secretary-treasurer of Foss Launch & Tug Company; Charles G. Cox, Nordberg Pacific Coast manager, Heavy Machinery Division, Orville Sund, general manager of the Foss Tacoma office and Carl Harris, branch manager, Nordberg Seattle office.



operates on a 24 hour a day, six days a week basis with three different crews running her on each eight hour shift.

Prior to the delivery of this vessel, all general harbor work had been handled by the *Peter Foss*, a tug of similar dimensions powered by a 350 hp. diesel engine. The older tug, through many years of service in handling ocean-going grain ships, tankers, large barges, log booms, etc., has about outlived her usefulness in this capacity. Also when handling a large ship, the *Peter Foss* has required the assistance of one of the company's big 1,000 or 1,200 hp. tugboats. Because of this and the in-





creasing harbor traffic, Henry Foss, secretary-treasurer of Foss Launch & Tug Company and Orville Sund, general manager of the firm's Tacoma headquarters, recognized the need for a tug of greater horsepower and reliability and as a result the *Brynn Foss* was designed and built to replace the *Peter Foss*.

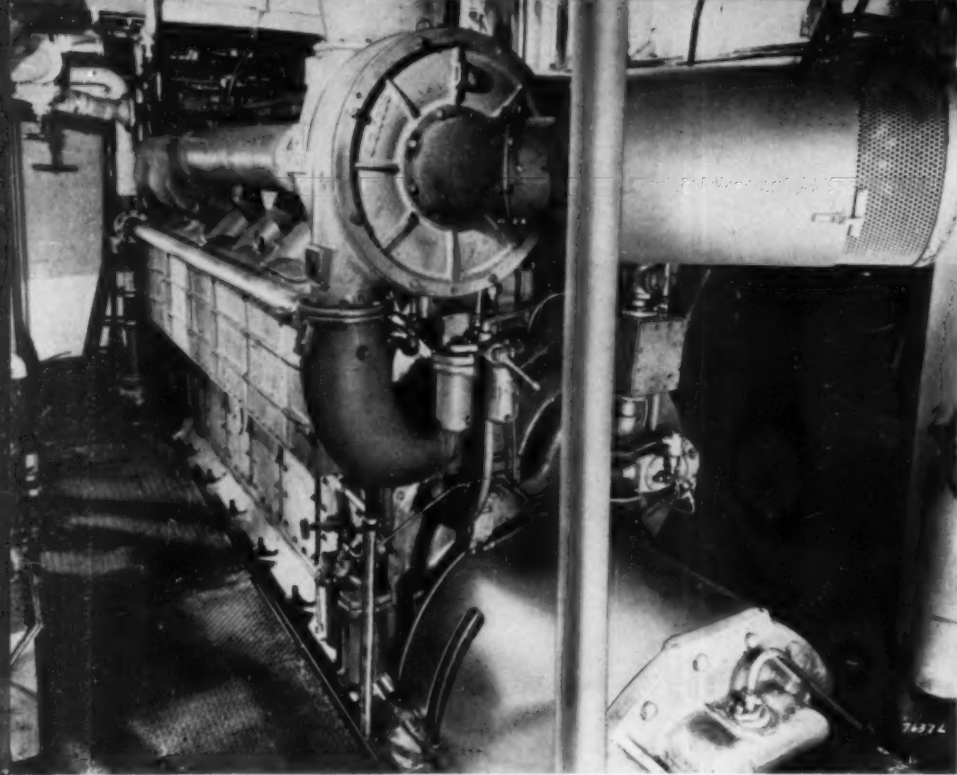
The *Brynn* is recognized as the first vessel to be powered by a Supairthermal engine and with the 800 hp. supplied by the Nordberg unit she will be capable of singly handling the docking of big ships in Tacoma Harbor. This power will be especially advantageous in view of the heavy runout of water

at tides. These runouts average more than nine feet and at times reach 14 feet.

Several considerations entered into the selection of the Supairthermal engine by Foss Launch & Tug Company. Primarily, the Nordberg engine offered one of the most efficient and compact power units that could be installed in this small vessel. The Supairthermal engine operates at 160 lbs. bmep. and is designed to produce one-third more horsepower than a conventionally turbocharged engine of the same size with no increase in maximum combustion pressure. For direct drive installations, the Supairthermal engine is designed to develop the

same horsepower at 25 per cent less rpm. This is particularly advantageous on a craft of this type where low rotative speed is necessary for maximum propeller efficiency. The Nordberg diesel engine propelling the *Brynn Foss* is of the four-cycle, heavy-duty, direct-reversing marine type with six cylinders of 13-in. bore and 16½-in. stroke. It develops its full rating of 800 hp. at 300 rpm.

In the *Brynn Foss* the Nordberg engine will turn an 84-in. diameter by 43½-in. pitch three bladed propeller. Remote control of the main engine is provided in both the pilot house and the flying bridge. Supplying auxiliary power on the new tug-



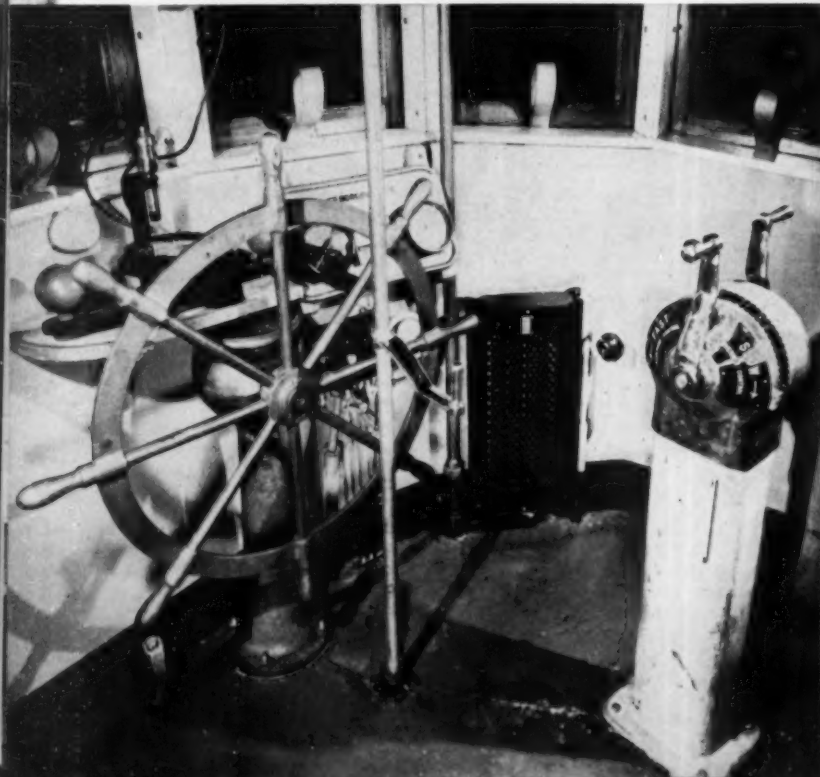
Engine room of the *Brynn Foss* with its compact, efficient 800 hp. Nordberg direct-reversing diesel marine engine. The new tug operates on a 24 hour a day, six days a week basis with three different crews running her on each eight hour shift.

boat are two 50 kw. auxiliary generating sets. All engine room auxiliaries are motor driven; one auxiliary power unit drives a Vickers hydraulic pump. This unit supplies hydraulic power for operation of the windlass and forward capstan, the towing engine and the steering gear. The other unit is arranged to drive a large 150# fire pump

which is used for fire service and for washing sulphur and sawdust barges.

The *Brynn Foss* meets all requirements of the American Bureau of Shipping for harbor and short coastwise towing. It is a flush deck tug of the round bottom design with a fairly flat deadrise.

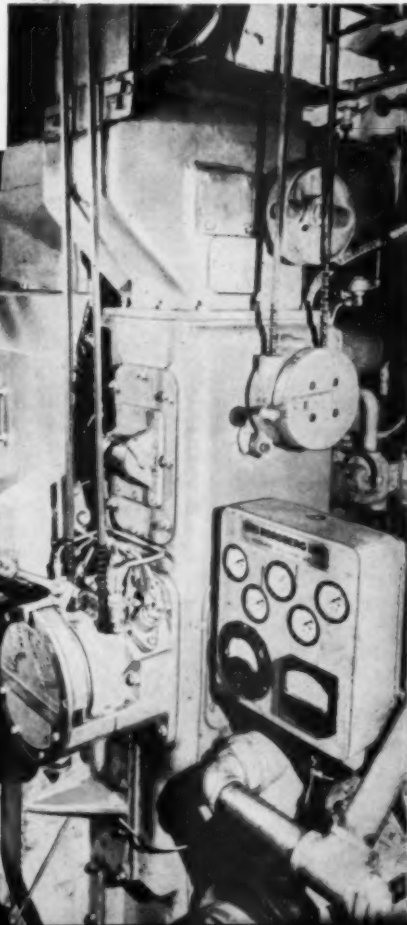
Pilot house of *Brynn Foss* showing control stand, wheel, Nordberg gauge board and compass. New tug is powered by 800 hp. Nordberg diesel engine.



A very slight tunnel aft gives the *Brynn* extreme maneuverability in close quarters without retarding pulling power or speed to any great extent. It has an all electric welded steel hull which has been built to an overall length of 72-ft. with a beam of 21-ft. and molded depth of 12-ft. The vessel has a normal draft of 9-ft. 6-in.

Mr. Hanson, in designing the vessel, made every provision for the construction of an exceptionally heavy duty hull in order to give the tugboat proper strength for docking service. Stringer plates of 1/2-in. thickness were used throughout. The hull is framed transversely and is divided into four extra tight bulkheads. Five large fuel tanks with a total capacity of 15,000 gallons are built into the hull longitudinally along both sides of the engine room. The *Brynn Foss* operates normally with a crew of four men, a skipper and three deck hands. There are, however, complete quarters for four crew members located forward under the deck and adjoining the galley. The upper deck house contains the skipper's stateroom, deck washroom and entry way. The pilot house is complete in every respect and is designed with clear vision all around. An access way is also provided to the top of the pilot house where the fire monitor, searchlight, etc., are installed. The large towing winch is set aft of the trunk and an anchor winch and bit is set in the bow. Large rubber bumpers are fitted fore and aft. During her recent trials, the vessel achieved a speed of 12 1/2 miles per hour running free and her owners reported her to have the flexibility needed throughout its entire scope of operations.

Operating end of the 800 hp. Nordberg four-cycle, six cylinder diesel in the *Brynn Foss*.



T
or
no
bo
of
ha
it
rad
tru
po
dep
are
wel
tion
the

Ele
to
ver
Lou
tra
Wa
Con
earl
wat
rail
mou
steel
wat
ble
hou
Two
tilat
sider
six p
rota
rails
weig

Unt
ceiv
try.
the
situa
the f
been
temp
milit
some
sian
been
kept
plan
ernm
alter

Thre
have
Car
Nava
toget

POWER PLANTS ON WHEELS

By RICHARD LaCOSTE

THREE gaunt, grey ghosts today haunt military men in America. These are sabotage, bombing or natural disaster. Department of Defense officials no longer can point proudly to their drawing-board plans. They must have a solution in the form of industries in being. Just as the military must have an air transport industry in being; just as it needs electronic plants producing radio and radar equipment; just as it must be able to move trucks and tanks off assembly lines so must it have power plants. And because diesel power plants are dependable, Department of Defense officials today are initiating a mobile power plant program that will may project diesel engineers into a production phase which may mean millions of dollars to the industry and which may last many years.

Eleven diesel mobile power plants, originally built to Russian specification, currently are being converted for emergency use in the United States. St. Louis Car Company has been awarded the contract with Navy's Bureau of Yards and Docks in Washington, D. C. laying down the specifications. Completion of the initial project was scheduled for early August. Each of the 11 diesel-type, 600-kilowatt generating plants is set up in a specially built railway car. The car is completely enclosed and mounted on two four-wheel trucks. It has an all-steel body, is insulated throughout and has a hot-water heating system with forced circulation. Double type KC-1012 air brake equipment of Westinghouse Air Brake Company manufacture is used. Two motor-driven exhaust fans insure better ventilation through radiator openings at the ends and sides of the car. Fire protection equipment includes six portable fire extinguishers and a motor-driven, rotary-type water pump. The complete car on rails—including full fuel tanks, water tanks, etc.—weighs approximately 168,000 pounds.

Until recently, mobile diesel power plants received little military-civil attention in this country. With the realization that the Russians had the atom bomb, a re-evaluation of the military situation became necessary. Carefully weighed was the fact that the Russians for some years now have been using mobile diesel power plants; that their temporary use in this country might become a military necessity. During World War II, we built some 200 diesel mobile power plants for the Russian Government. Fourteen units that had not been delivered to Russia when war ended were kept in the United States. Three of the power plants later were turned over to the Turkish Government where they can be operated without alteration.

Three of the diesel mobile power plants already have been completely remodeled by the St. Louis Car Company, and now are at the Charleston Naval Shipyard where they probably will be kept together because of a spare parts problem. These

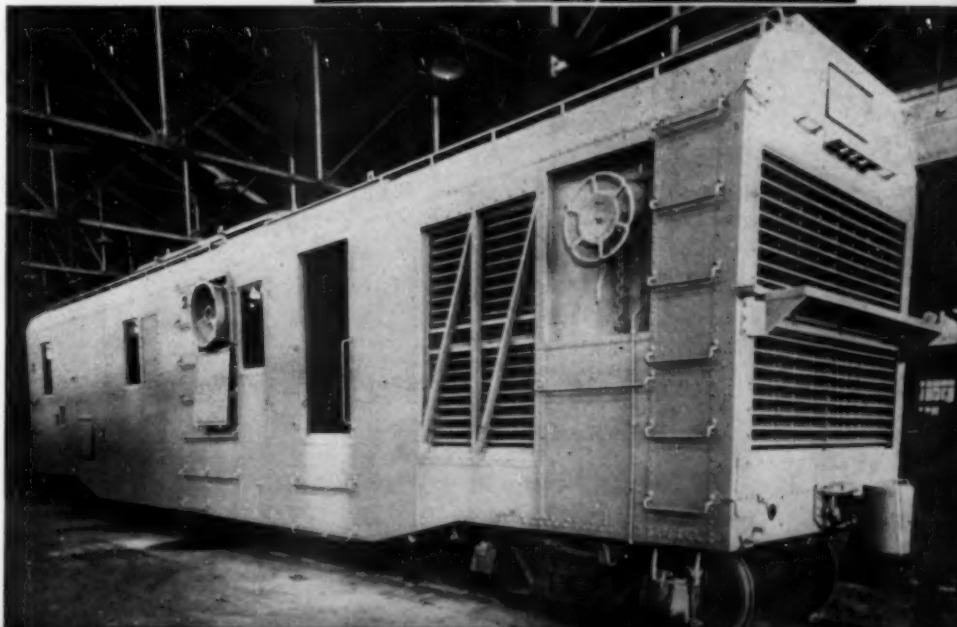
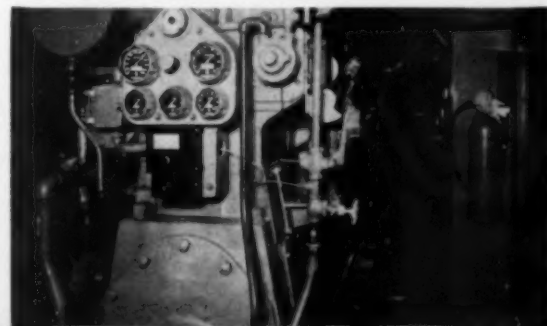
three diesel units are different from the other eight now being remodeled. Conversion of the power plants by no means is a minor job. The work includes the removal of the 50-cycle generator, which was specified by Russia but unusable in this country, and the installation of a standard American 60-cycle generator, 3-phase, 480 volts built by Westinghouse. An auxiliary engine-generator set is mounted on a common base. The full diesel, supercharged, solid injection engine is connected directly to the generator. The engine uses heavy fuel oil. The three already converted mobile 6-cylinder diesel-electric generator plants at Charleston are powered by Cooper-Bessemer engines which develop 870 hp at 90 degrees Fahrenheit. Bore and stroke of the Cooper-Bessemer is 13-in. by 16-in. The eight units scheduled to be completed by early August are powered by Worthington engines. These, too, are 6-cylinder diesels.

Specifications call for 600 rpm. Bore and stroke is 12-in. by 14-in. Cost of modifying the first three plants for use in the U. S. was \$30,000 each. Original cost was about \$100,000. Engineers estimate that at present prices construction cost of a unit would be approximately \$150,000.

In addition to dependability, diesels make for economy of operation, are sturdier and lessen the civilian as well as the military manpower load. All these considerations are being carefully weighed by the Department of Defense in all present planning. When scientists recorded on their seismographs that an atomic explosion had taken place behind the Iron Curtain, power plants—and especially mobile diesel units—assumed a new importance. Government power plant engineers took a second look at their national power charts and graphs. They realize as do the military the vital necessity of mobile diesel plants. In the conversion of these 11 diesel power plants, the military have shown an awareness of the need for mobile power equipment. At least, the know-how and an industry in being are being developed.

How far this development is carried forward depends entirely upon the vision and foresight of our military men. One plant alone could provide at least the minimum electric current requirement at any installation. In a matter of hours, these rail-rolling diesel power plants would be able to render valuable, dependable service within a radius of 100 miles or more.

The submarine-like compactness of the mobile diesel-electric generator plant is shown in this picture, giving a view of the end of the engine. The generator is at the right. About 200 of these mobile power plants were built for lend-lease to Russia during the war. Eleven units which were never delivered are being converted to American standards as standby plants for use during an emergency.



OUTBOARD PROPULSION FINDS ITS PLACE

THE heavy duty outboard for use as a propulsion and steering unit is not exactly a new idea. Army Engineers experimented with the idea some thirty years ago. One was built not to set on the deck as the present Harbormaster but to be bolted to the stern transom. The engine setting back some distance and driving through a long drive shaft through the transom. It was a massive piece of iron, with big cast iron gears, driven by a slow speed engine.

This, perhaps the first, outboard for heavy duty work was delivered to the Engineers at Paducah, Ky. It was installed on one of their crane barges and started across the Ohio toward the Illinois shore. It had reached midstream and going fine when suddenly there was a clashing and grinding in the lower set of gears and that was it. The gears while big and heavy were not capable of taking the load and at least one of them had been stripped. There were a few half hearted attempts to repair and strengthen the gear train but it was never successful. It was kicked around for several years and in 1943, three years after the forerunner to the present Harbormaster had proven a success, was sold to a junk yard for scrap.

The Navy became interested in outboards for heavy duty in thirty-nine and forty. Murray &

Tregurtha of Quincy, Mass., designed and built the first units for the Navy. They were powered with Waukesha diesels and equipped with remote electrical controls through a fifty foot rubber covered cable. The object was to enable the operator to post himself on top of the load and have an unobstructed view. The propeller which supplied the propulsive power was also capable of turning 360°. The steering or turning of the propeller from side to side was accomplished through a three hp. electric motor and controlled from a small box the operator could carry with him at the end of the fifty foot cord. At the outbreak of World War II, this unit was redesigned. The gearing was changed to enable the use of truck gears easily obtainable. The electric controls were taken off and the unit was built with mechanical controls and hand steering. Thousands were built, some with gasoline engine power but mostly powered with G.M. 6-71 diesels.

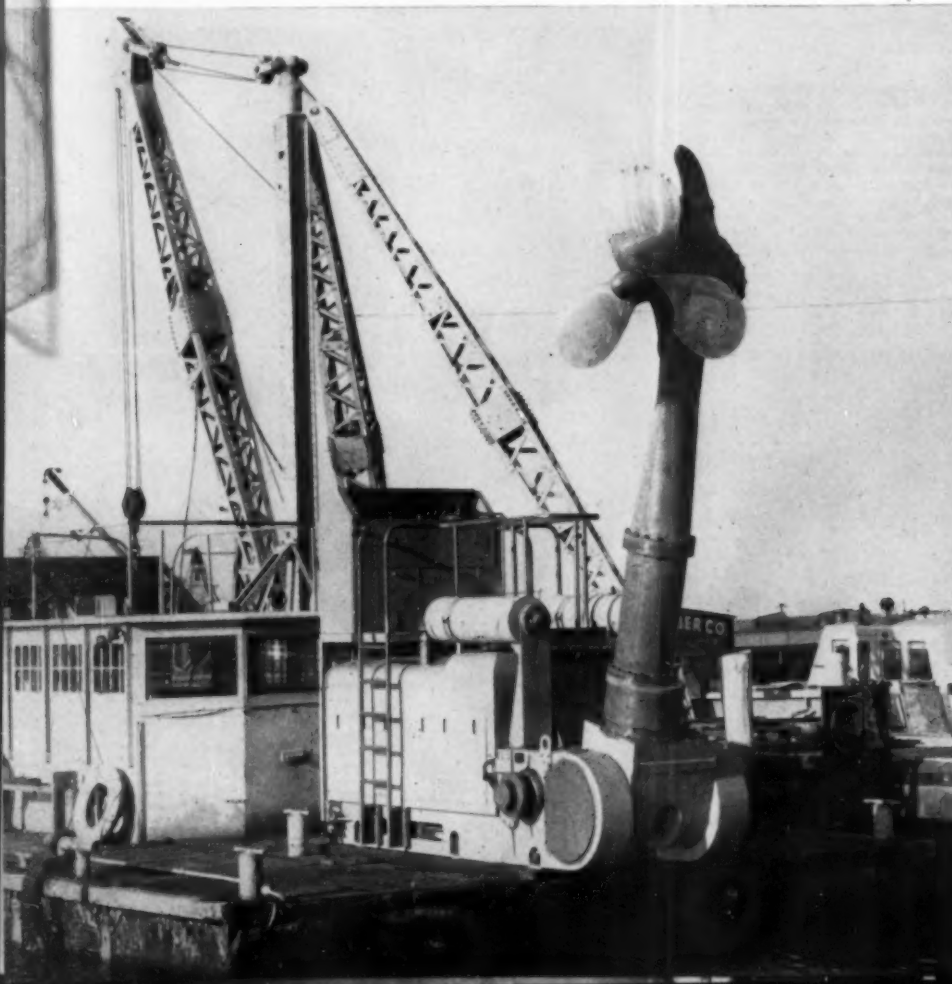
While there is no actual count of these outboard units now in commercial use, it is safe to say they run in the thousands. A great many were returned to the states at the close of the war and sold as surplus. They were picked up by a great many outfits because they were being sold at a very low figure well under the engine cost. In some cases the installations were so wrong that they could not work but in the greater percentage



◆ The 300 horsepower Harbormaster unit, 12 ft. stem from deck to centerline of the propeller. Repairs can be made without dry-docking.

of cases, these units have given complete satisfaction. In cases where the application was suitable and the units were operated in the proper manner and taken care of they are still in use and doing a good job. These surplus outboards were built for military use and to do one job. Namely to land material and supplies on a beachhead. The gear train made up of automotive gears was not designed for constant operation as is found in most present day commercial usage. They last indefinitely if used as the Army and Navy intended to use them and as they were designed to be used.

At the close of the war there seemed to be one of two courses to follow. Either class the outboard as strictly for military use and stop the manufacture or redesign the entire unit for commercial use. As there seemed to be considerable interest in the unit for commercial use, the latter course was adopted. The first step was to engineer a gear train capable of standing up under constant operation, then build the outboard drive around this gear train. This was done, the gears were specially designed for 80,000 hour life,





View of the *Cartasca* stern showing the multiple outboard installations. This was the first such installation.

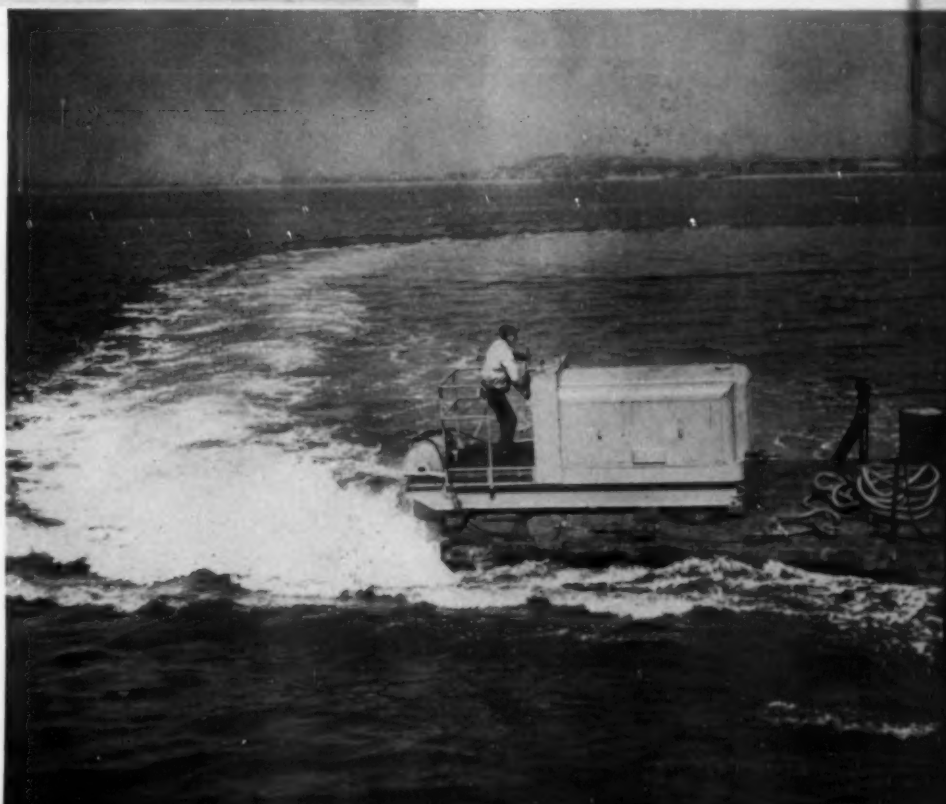
the lubricating system was improved, the underwater section streamlined for effectiveness and the remainder of the unit for ease of operation and convenience of upkeep. Several models were made available and in a year or so units of from 20 to 400 hp. were available for commercial use. All units from 40 hp. up were designed for diesels so that at present there are ten models of varying hp. to take the place of the 115 hp. military or surplus units.

One of the first installations was made on a towboat operating on the New York State Barge Canal. The main power was supplied by an inboard engine operating in the conventional manner. The outboard was primarily to be used for steering the tow. Rudders were omitted and the thrust of the wheel controlled from the pilot house was able to maneuver this tow around the sharp bends, into and out of locks with such ease and saving of time that the two tows so equipped were able to double the number of trips between Oswego on Lake Ontario and Albany at the eastern end of the Canal. The first permanent multiple drive installation was installed on the

Cartasca, a grain tow operating on the Mississippi, Ohio and Tennessee rivers. Three units of 300 hp. each were mounted on the stern of a specially designed hull, the outboards were driven by Twin G.M. 6-71 diesels—the engine being placed in an engine room on the main deck. The units controlled from the pilot house of the integrated tow. To make this perhaps the best controlled tow on the rivers a unit one-half the power of the propulsion units on the stern or 150 hp. was located in the rake of the leading barge in the tow. Controls were run back over the decks to the power unit at the stern. Now the pilot had not only control of the tow's stern but also of the head of the tow. This is about the ultimate in steering. The tow has been in operation for over six years, the upkeep on the diesel engines has been that customary on engines of this type, while the outboard drive has at the latest check operated for over forty months without, as the port captain states "the necessity of touching a wrench to it."

These are only a few examples of the way in which the dieselized Harbormasters are being operated. One of the latest installations built by Murray & Tregurtha and on which a repeat order is about to be shipped, is a shallow water pusher. By installing multiple units of 40 hp. with a central control station, the units swing a 28 in. x 17 in. wheel at 610 rpm.—120 usable horsepower in 36 in. of water. Enough power to move over 500 tons at a speed of 5 mph. The towboat itself is 41 ft. long, 16½ ft. wide. The barges which accompany these boats are 94 ft. in length, a beam of 24 ft. and a depth of 5 ft. Each barge has a cargo capacity of 130 net tons on a draft of 3 ft. Running free the towboat is capable of 9 mph. Possibilities of these outboard drives seem limitless.

Note the extreme maneuverability of the Harbormaster powered barge.



SHORT CUT TO DIESEL MAINTENANCE

By A. G. RINGER*

RECENT studies of power tool applications show the tremendous time and cost advantage of impact tools for the repair and maintenance of diesel engines. From actual on-the-job studies in service shops, statistics have been developed which show that these tools, either air- or electric-driven, saved from 33% up to as much as 80-90% of the time required with a hand wrench on nut-running operations. With standard accessories, they are also used for drilling, screw and stud-driving or removal, tapping, and reaming.

For example, a railroad shop using an Ingersoll-Rand air Impacttool for an hour, saved six hours in removing screws from diesel engine side sheets. At the wage rate of \$1.60 per hour, doing the work with the power tool saved the shop \$9.60. As the tool cost \$140, it paid for itself in less than 15 hours.

A stripping and construction company in Pennsylvania maintains a fleet of between 75 and 100

*Chief Engineer, Power Tool Division, Ingersoll-Rand Co.

Here the electric Impacttool is being used to drill a 1/4-inch hole in a broken stud in the block of a Cummins diesel engine. Next the tool is used with an "Ezyout" to remove the broken stud.

This Caterpillar diesel engine was moved out of the repair shop and put back on the job more quickly because an electric impact tool saved one-third of the time in running the nuts on the connecting rods. A 1-inch socket is being used.

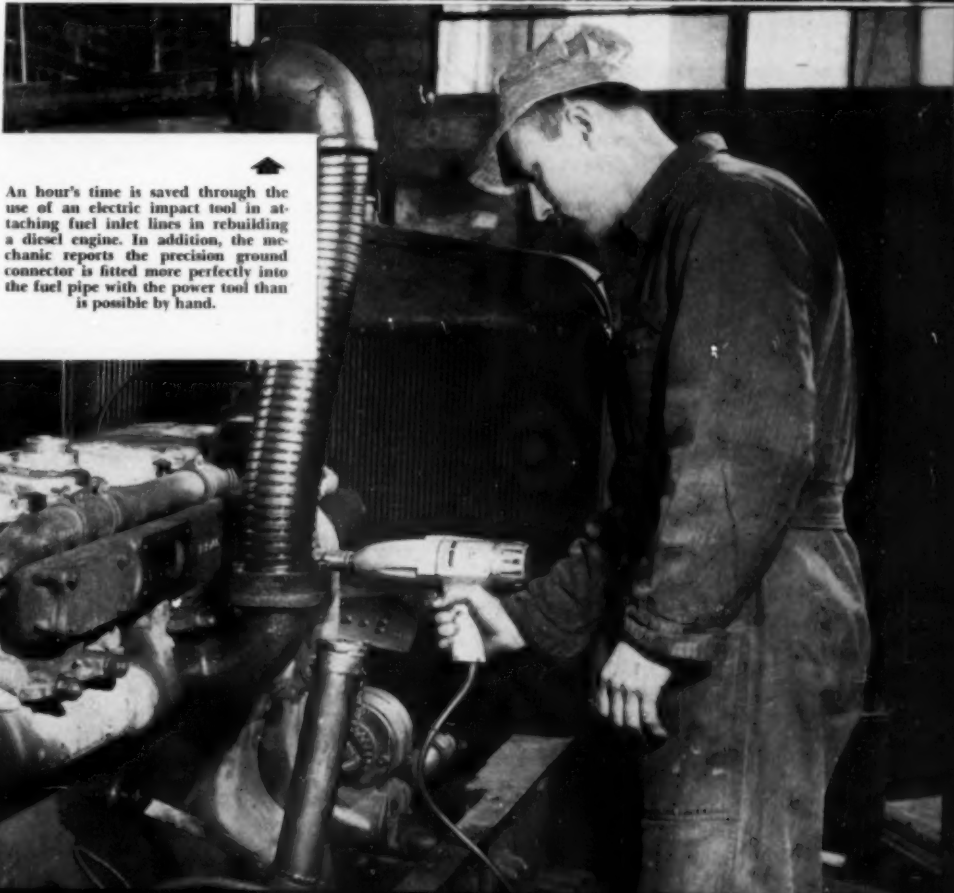
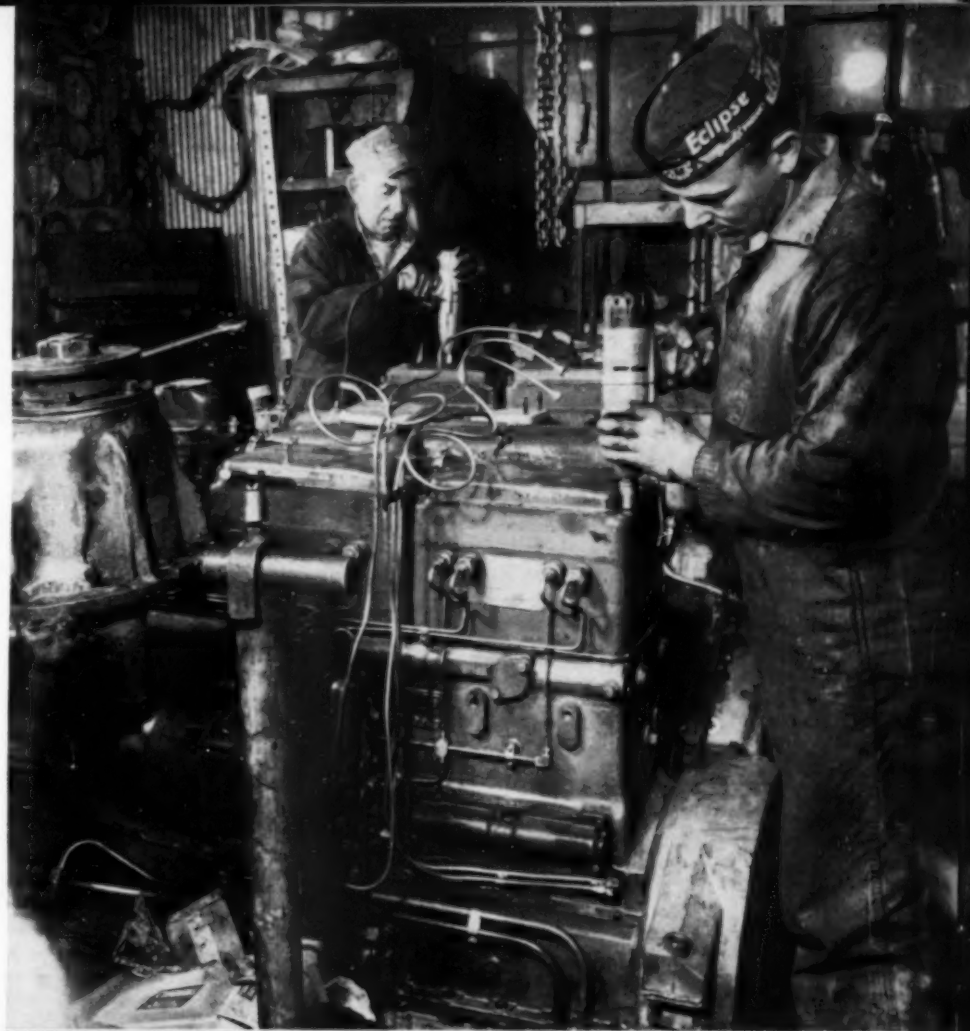
trucks, cars, and miscellaneous equipment. Under tough earthmoving service, the automotive equipment is frequently in need of repair. Several Ingersoll-Rand electric Impacttools are in daily use in the service shop where it is estimated that they cut maintenance time at least 33%. A Hazleton, Pa., construction company finds that Impacttools save up to 60% of the time usually required for many repair jobs.

Mechanics can renew threads in wheel lug nuts and axle studs on overhauling trucks in 35 minutes with the Impacttool, a job that formerly took 1½ hours with hand tools. In another application in this same repair shop, an hour is saved in attaching fuel inlet lines to rebuild Cummins and Caterpillar diesel engines, by using the tool for nut-running. Setting standard studs for rocker arms requires only a few minutes. These are not isolated examples. Similar savings can be computed wherever the Impacttools are used.

Time and cost savings in the use of air or electric Impacttools result from impact mechanism, which delivers thousand of rotary impacts to the work whenever the spindle meets resistance. Instead of stalling, the Impacttool instantly releases a series of rapid, powerful turning blows which loosen the nut or stud in a few seconds. When this extra turning power is not needed, the Impacttool runs as any conventional electric or air drill. Since the effort comes from the tool, and not from the operator, and since there is no torque reaction to tire the worker, mechanics report that they can run the impact power tools a whole day without fatigue. Low upkeep, long life, and dependability are additional characteristics which Impacttools offer to diesel service shop work.

Latest addition to the line of electric Impacttools is the Size 34U, which has been developed especially for heavy bus and truck work. It has a capacity up to 1¼-inch thread size. The air tools require only a supply of compressed air at 60 to 130 lbs. pressure for operation. The electric tools can be operated on 110 volt ac. or dc. current. Models are also available for 220 volt operation.

Here the electric Impacttool with a 15/16-inch socket is used for running down nuts on the exhaust manifold of this Cummins diesel engine. The tool saves at least one-third of the time on the job.



An hour's time is saved through the use of an electric impact tool in attaching fuel inlet lines in rebuilding a diesel engine. In addition, the mechanic reports the precision ground connector is fitted more perfectly into the fuel pipe with the power tool than is possible by hand.

THE "ELISHA WOODS"

By DAVID I. DAY

IN early February this year, despite bad weather and floating fogs, the inland rivers carried a satisfactory amount of traffic. A motor vessel attracting perhaps more attention than any of the others was the *Elisha Woods* of the A. L. Mechling Barge Lines, Joliet, Ill.

This boat was accompanied all the way up from Port Arthur, Texas, by favorable newspaper comment and being for a long time quite a popular pusher it seemed that everyone turned out to see her. We caught up with the boat as she worked her way at a steady gait up the Tennessee River, known now widely as "The Great Lakes of the South." She had made her way through the Intracoastal Canal, up the Mississippi, up the Ohio and was now passing the old Battlefield of Shiloh on her way to Muscle Shoals Dam below the Alabama line. She passed within a day or two the river ports in northern Alabama, Florence, Sheffield, Decatur and others. She passed Chattanooga in the shadow of Lookout Mountain and continued through the mountains to Knoxville at the head of Tennessee River navigation.

Once more the *Woods* was demonstrating the one quality which more than any other has endeared her to the hearts of rivermen. She was once more revealing her dependability which has won for her the nickname of "Old Reliable." The boat is not as fast as some later ones. She is not as big nor as powerful as many working on our waterways. But in handling 40,000 barrels of gasoline against swift and swollen channels, she will take care of herself as well as any that ever operated on sweet water. On this, her first work journey of 1952, the boat was commanded by Capt. Ivan Howlett with Capt. Noel Clarke as relief master. In the pilothouse was Capt. A. L. Striegel. Chief Kenneth Clay was in charge of the engine room with Charles Maples as relief chief and Stanley Young as assistant engineer.

Reports from the mountain ports of Chattanooga and Knoxville mentioned the ease with which the *Woods* handled her long-trip cargo. The whole story was one constituting a tribute to the "staying quality" of diesel engines. So far as the eye or ear could detect the boat possessed all the smoothness of operation that set her apart so favorably in the early months and weeks of her years of service.

She came off the ways at the Nashville Bridge Company yards in June, 1946, the first major twin-screw boat to be equipped with General Motors 2-cycle diesel engines. It is often said that her first five trips established the reputation of the vessel and especially of her very neatly arranged engine room. The *Elisha Woods* was about a year old before we saw her at close range. She was well up the old Mississippi, some miles above Davenport, Iowa, on her way to St. Paul. It was ideal summer weather and the river channel was blue-clear. Some days afterward we received official word that she had

made the run from Norco, La., to the Twin Cities behind 38,000 barrels of gasoline in record time—10 days and 14 hours. This included a number of stops. Her average speed was 6½ miles an hour and when we saw her she was making even better time. Within four weeks we found the boat again on the run to St. Paul with a cargo of greater size. At that time she was some 40 miles below Memphis, with rain descending in sheets, the wind rising rapidly, the river very unruly. Yet her big Federal Mogul propellers were turning rapidly and effectively. Evidently all was well with the smoothly operating pair of main engines.

It is often declared by rivermen that a new boat is like a new automobile. Once well lubricated, it is almost bound to turn in a perfect performance. But after years of grueling work, absorbing punishment mile after mile, the good boat like the good car will demonstrate itself. In the last five years and more we have been checking the labors of the *Elisha Woods* and we can testify to her prowess under all sorts of operating conditions. On the canals, on the long length of the Mississippi, and on the Ohio from Cairo to Pittsburgh we have seen her moving long tows in all seasons. Only once in that time have we found this workboat taking life easy. One Christmas season a few years ago Capt. Abner Fricmonth, the "old Missouri River boy," had just tied her up at the Paducah, Ky., shipyards for new cylinder liners and a general check-up.

The *Woods* is 112 x 27 x 9 feet in dimensions. She is built with a straight stem, a model bow, and a rounded, modified tunnel stern which is a typical Nashville Bridge design. There are two steering rudders and two flanking rudders. Each set is on a separate steering gear. On visiting this sturdy time-tested towboat, one is invariably impressed with the comfortable deckhouse. There are ample quarters for 14, with room for eight on the main deck and for six on the boiler deck. Forward on the boiler deck you will be ushered into a light and well-ventilated lounge. The pilot house of the *Elisha Woods* is one of the neatest and most commodious to be found on any of the medium-sized vessels of the river fleets. It is completely equipped, allowing a complete unobstructed view in all directions.

The propellers are each 74 in. in diameter with a 54-in. pitch. The main engines, General Motors (Cleveland) are 8-cylinder units, the cylinders being 8¾ x 10½ in. They are made to yield 750 hp. each at 750 rpm. Power is sent through a drive with reduction gear ratio at 2.303 to 1. The boat over the years has been a carefully maintained craft, with repairs and all adjustments as needed. Nevertheless, it is a tribute to the inherent "staying qualities" of these diesel engines when we call attention to present efficiency and smoothness of operation after all the severe punishment they have taken since 1946. The engines have worked night

and day, in all sorts of climatic conditions, on all the important inland rivers.

You will find the 30-kw. generators in excellent condition, driven by General Motors diesels of 45-hp. at 1200 rpm. These little units have each three cylinders, size 4½ x 5 in. The fire pump has a 2½-in. suction and a 2-in. discharge driven by a 15-hp. Westinghouse dc. motor. The pump delivers 100 gpm at 100 psi. discharge pressure. The capstan is of Nashville Bridge design and construction and is driven by a Westinghouse electric motor, 10 hp. at 1750 rpm., handled through a Palmer-Bee worm gear speed reducer, 35 to 1. A Westinghouse drum controller is in use. In use also will be observed a pair of Gardner-Denver 5 x 2 x 4 air compressors. The starting air compressor is handled by a 15 hp. Bardco motor. The service air compressor is driven by a 10 hp. (1750 rpm.) Westinghouse motor.

Many people well-informed in river shipping matters have expressed admiration for the many excellent "minor items" which add to the daily efficiency of the *Elisha Woods*. These items of interest include the 9½-hp. Ingersoll-Rand reversible air motor. It has 90 pounds pressure driving through a 35 to 1 Palmer-Bee reducing gear. Included in the above category also are the Honan-Crane lubricating oil pumps, both of half-inch size, both driven by ½ hp. electric motors of Marathon make. Included also in all appraisal of the boat's unquestioned ability to move heavy loads and provide living comfort for skilled boatmen are the two sanitary water systems handled by pump and motor from Fairbanks-Morse. The pumps are of 250 gpm., driven by 1/6 hp. motors. The fresh water is handled in the same way. Heating the vessel for comfort, no sweating, no overheating difficulties, combine to make another point in the vessel's present popularity. Many former officers, and crew members have testified to the boat's "high livability."

The heating boiler was manufactured by the well-known American Radiator Company and uses oil. The 1½ in. Bell & Gossett circulator is driven by a very small Wagner motor. The heating oil burner has a General Electric motor, the burner being from York-Shipley.

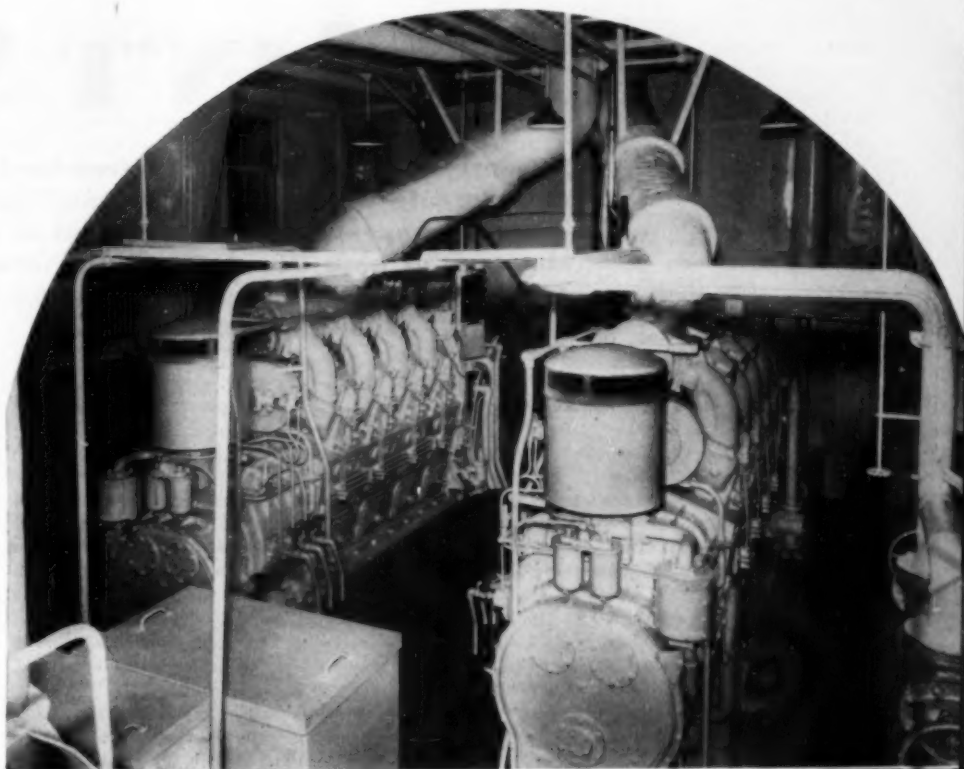
Many have recalled in river interviews the first trip of the *Elisha Woods*, fresh from the ceremony of christening. The boat that day was in charge of Capt. D. E. Lucas with Chief Engineer L. C. Smith handling the engine room details. Naturally, the performance of the main engines was the principal topic of conversation aboard. The G-M engine was making its practical debut on the inland rivers. But many mentioned the excellent pumping systems, the heating arrangements, and the easy-flowing steering power. The same qualities excite praise today. The boat has pushed barges, loaded and empty, thousands of miles. Millions of dollars worth of petroleum products have been transported by her. She has exerted herself to the utmost in all sorts of waters and weather. Just recently at Mt. Vernon, Ind., folks mentioned the work of the *Woods* there when that city was one of the busiest of Ohio River oil ports. In Madison, Ind., rivermen told of the sudden freeze which caught the vessel

in their harbor. One of them said: "In more than 100 years, this town never liked a towboat better."

Perhaps, the fact that Capt. Elisha Woods still lives adds a bit to the public interest in his namesake boat. Usually at home on his southern Indiana farm, a short drive from Louisville, he is wintering

in Cairo, Ill., to be near relatives. It was in Cairo that he worked for many years as a superintendent of the Barrett Lines. Near the city, where the Ohio joins the Mississippi, is a lasting monument, the Elisha Woods Light. In Cairo, too, his four sons, all river captains of prestige, have lived and are well-known. Our last stop aboard the veteran pusher is the galley. It is equipped to handle all the needs of the cook. Among other things it has a big Tyler refrigerator, with a Frigidaire compressor, powered by a small General Electric motor. There is a small Bodine motor blower, the ice-making coil is from Frigidaire. The food cabinet is of Fowler make, with a Wagner motor and a Servel compressor. The range is an oil-burning Stamford Shipmate. The water cooler is from Halsey-Taylor, with the exhaust fans bearing the Signal brand.

(Editor's Note: Originally the *Elisha Woods* was owned by Charles C. Smith Company, Houston, Tex., but in 1948 joined the fleet of the Sohio Petroleum Company. After Sohio discontinued river activities, the vessel went to her present owners, the A. L. Mechling Barge Line, Joliet, Ill.)



IT AIN'T SO

Recently there has been a determined effort to stop the sale of Diesel, Dual Fuel and Natural Gas engines by spreading the rumour of an imminent shortage of both Diesel Fuel and Natural Gas—It Ain't So!! A distinguished Washington Correspondent tells you why.

By PAUL WOOTON

AVAILABILITY of oil and gas in the United States and foreign countries will increase steadily during the next five years, provided there is continued adequacy of economic incentives and adequate supplies of steel, according to a report issued by the National Petroleum Council. The report was issued by the N.P.C. Committee on Oil and Gas Availability, of which L. F. McCollum, Houston, president of Continental Oil Company, is chairman. It was prepared in response to a request by H. A. Stewart, director of the Oil and Gas Division of the United States Department of the Interior.

"It is estimated that the availability of petroleum liquids in 1955 will be higher than production in January 1951 by not less than 1,324,000 barrels daily in the United States, and 2,171,000 barrels daily in foreign countries outside of those dominated by Russia," the report stated. "This minimum expectation is almost equal to the increase in production from 1946 to January, 1951. Under favorable conditions the availability in 1955 may exceed production in January 1951 by more than 5,300,000 barrels daily.

"Available supplies of natural gas in the United States will also increase," the report continued. "By 1955 it is expected that there will be 9.5 to 11.9 trillion cubic feet annually, compared with production of about 6.2 trillion cubic feet in 1950 to 4.0 trillion cubic feet in 1946. No estimates of foreign availability of natural gas have been prepared because of relatively limited use of such gas for fuel."

Commenting on the world-wide, long-term outlook, the report stated that "the supplies of oil in the United States and the world are greater than ever before and are still increasing rapidly." Study of both the immediate outlook and the long-term outlook for petroleum supplies, the report stated, leads to the following conclusions:

- "1. Available supplies of oil and gas will continue to increase rapidly for the near future.
- "2. Large quantities of oil and gas remain to be found in the United States and foreign countries.
- "3. Techniques for finding and producing oil have improved greatly, are currently being improved, and will continue to improve.
- "4. Increasing availability of petroleum can be

counted on in the United States and world-wide, provided reasonable economic incentives and a favorable climate for private investment are maintained.

"5. Energy from other sources at attractive prices may finally bring about a decrease in petroleum demand before any lack of prospects causes a decrease of available supplies.

"6. Competition among fuels is the best way to supply our needs for energy at the lowest cost."

"In short," the report continued, "the United States and the world can count upon increasing supplies of oil and gas not only for the next few years, but for the foreseeable future, provided that reasonable economic incentives, adequate materials, and a favorable climate for private investment prevail."

Tremendous potential petroleum deposits "will remain to be discovered, both in the United States and other nations, the report points out, as there is possibly oil-bearing sediment underlying about 80 per cent of the country. The American Association of Petroleum Geologists has estimated that approximately one billion acres of land in the United States, in addition to present producing areas, are potential oil-bearing lands. The billion acres is 100 times the area proved productive by all oil discoveries to date. The committee emphasized that proved production in some of these prospective oil producing areas may be many years away. How many years away full appreciation of the potential reserves may be depends to some degree on technology, but to a greater degree on economic factors, according to the report.

"Unfortunately, there is no satisfactory way of estimating the oil and gas reserves underlying the surface, or what part of that volume will be found and developed commercially," the committee reported, pointing out that, at current drilling prices, it would take hundreds of years to drill just one well per square mile over the prospective areas."

The most important factors are the lack of any imminent shortage of oil or gas, and that even today's informed estimates of reserves may be conservative, the committee emphasized. "We do not believe that in 1900 or 1925 the best informed opinion of the industry would have considered possible the actual developments which have taken place in petroleum. We know that as recently as

1946 industry experts were presenting to Government committee estimates of demand and supply which have already proved to be very conservative. We know that a similar projection of available supplies made in 1948 by the American Petroleum Institute has been exceeded substantially."

"In September, 1926," the report continued, "the Federal Oil Conservation Board reported that proved reserves were estimated at about 4.5 billion barrels or only about six times as much as the annual rate of production at that time. Nevertheless, the United States did not run out of oil in six years. In fact, the proved reserves of oil are now 29.5 billion barrels. The production of petroleum in the United States in the period 1926-50 was 34 billion barrels of oil. In other words, the 59 billion barrels of oil produced and added to reserves since 1926 are 13 times as much as the estimate of proved reserves in 1926.

"Available supplies of oil and gas in the United States and the world are greater than ever before, and are still increasing rapidly. Granted continuation of reasonable economic incentives and adequate supplies of materials, crude oil and natural gas may be counted upon to be available in abundance for the foreseeable future," the report assures. "We have tried in this study to be as realistic as possible," the report states, "Still, the future may prove that we, too, have been conservative in projecting how far and how fast we may move ahead."

Increased knowledge of sciences such as geology and geophysics, and advanced techniques have accounted for the rapid expansion of oil discovery and production in the first half of the century, the report explains. More knowledge of how oil and gas behave in their underground reservoirs, and greater emphasis on deep drilling may help bring about even larger discoveries, it adds. "To date, by far the majority of the oil discovered has been at less than 5,000 feet. Up to January 1, 1950, only about 600 exploratory wells had been drilled below 12,000 feet, although in a large part of the prospective area the sediments in which petroleum deposits may occur are more than 15,000 feet deep."

But the true key to how much oil will be found, and how soon, rests in the simple economic fact that "it is the hope of realizing a profit which spurs

operators to search for oil and improve technology. There must be reasonable opportunity for development of resources as well as economic incentives in order to bring about availability. Any government actions which interfere with the opportunity to search for oil will handicap future supplies," the report asserts. "Nationalization, expropriation or failure to permit exploration can drastically retard the development of supplies. Artificial price or material controls may do the same."

Although Russia once was the kingpin of oil production, the non-communist nations today probably produce 10 times as much oil as the U.S.S.R. and her satellites, the report observes. "In 1900 crude oil production in the world was 400,000 barrels daily, half of which was in Russia. By 1950 world crude oil production, exclusive of Russian-dominated areas, had increased to about 10,400,000 barrels daily, whereas production of Russian-dominated areas was estimated to be less than one million barrels daily."

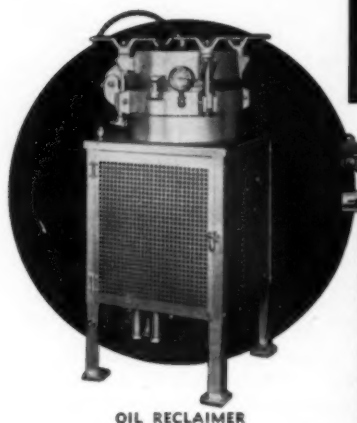
As to the outlook for the second half of the century, the committee estimated that it is possible that the development of other sources of energy, including atomic and solar energy, may reduce the demand for oil through competition long before

all the potential reserves of oil are even discovered. The committee members, aided by petroleum industry experts, spent more than a year in an intensive study of present and future oil and gas supplies, with particular attention to prospects for the United States. "As a result," the report points out, "this report reflects the best judgment of oil industry specialists who have studied this subject for years as well as of the members of the committee."

Committee Chairman L. F. McCollum, president of Continental Oil Company, praised highly the members of the committee who worked on the report. "It would be hard to find a finer example of American democracy in action than the fact that this group of oil men, representing many companies in a fiercely competitive industry gave unstintingly of their knowledge and time to prepare a report which defines clearly the present and future position of our country and the rest of the free world with regard to petroleum supplies," Mr. McCollum said. Members of the National Petroleum Council Committee on Oil and Gas Availability, in addition to Chairman McCollum, are: K. S. Adams, Phillips Petroleum Company; Hines H. Baker, Humble Oil & Refining Company; Max W. Ball, independent oil consultant; H. S.

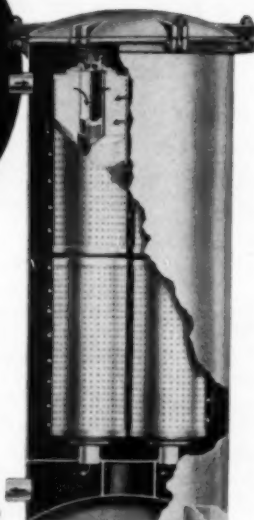
M. Burns, Shell Oil Company; Howard A. Cowden, Consumers Cooperative Association; Ralph K. Davies, American Independent Oil Company; E. De Golyer, De Golyer and McNaughton; J. C. Donnell II, The Ohio Oil Company; R. G. Follis, Standard Oil Company of California; Robert L. Foree, Texas Independent Producers and Royalty Owners Association; B. I. Graves, Tide Water Associated Oil Company; Jake L. Hamon, Mid-Continent Oil & Gas Association; B. A. Hardey, independent petroleum producer; D. A. Hulcy, Lone Star Gas Company; A. Jacobsen, Amerada Petroleum Corporation; B. Brewster Jennings, Socony-Vacuum Oil Company, Inc.; J. P. Jones, National Stripper Well Association; John M. Lovejoy, Seaboard Oil Company of Delaware; A. C. Mattei, Honolulu Oil Corporation; N. C. McGowen, United Gas Corporation; E. E. Pyles, Jergins Oil Company; Ralph O. Rhoades, Gulf Oil Corporation; R. S. Shannon, Pioneer Oil Corporation; P. C. Spencer, Sinclair Oil Corporation.

Stewart M. Vockel, The Waverly Oil Works Company; J. E. Warren, Independent Petroleum Association of America; W. K. Warren, Warren Petroleum Corporation; L. S. Wescoat, The Pure Oil Company, and Robert E. Wilson, Standard Oil Company (Indiana).



OIL RECLAIMER

- PURIFIERS
- FILTERS
- RECLAIMERS
- CONDITIONERS



FILTER

HILCO

LUBE and FUEL OIL PURIFICATION - - -

15 YEARS CONTINUOUS OPERATION WITHOUT OIL CHANGE IN DIESEL AND GAS ENGINES—NEGLECTIBLE PISTON AND CYLINDER WEAR.

THIS IS THE RESULT OF COMPLETE PURIFICATION—THE REMOVAL OF SLUDGE, CARBON, ACIDS, WATER, AND FUEL DILUTION.

HILCO UNITS IN OPERATION LONG ENOUGH TO PROVE THEIR VALUE. ONE-QUARTER CENTURY OF EXPERIENCE IS AT YOUR SERVICE.

THERE IS A HILCO FOR EVERY LUBRICATION AND FUEL OIL FILTERING PROBLEM - - -

YOU WANT CLEAN OIL AND CLEAN ENGINES TO SAVE EQUIPMENT—OIL AND MONEY—INVESTIGATE HILCO OIL MAINTENANCE METHODS.

★ **WRITE FOR FREE LITERATURE - - NO OBLIGATION**

THE HILLIARD CORPORATION, 122 W. FOURTH STREET, ELMIRA, N. Y.

IN CANADA—UPTON-BRADEEN-JAMES, LTD., 990 BAY STREET, TORONTO, 3464 PARK AVE., MONTREAL

E

xchange Your Diesel Maintenance Ideas

CONDUCTED BY R. L. GREGORY

Maintenance Costs of Large Heavy Duty Slow Speed Diesel Engines in Power Generation

Part II (continued)

FOREWORD: The following is a continuation of Part II of a paper presented by Mr. J. B. Sims, Supt. of the Board of Public Works of Grand Haven, Michigan at the fall meeting of the Michigan Municipal Utilities Association, Part I of which appeared in the March issue of DIESEL PROGRESS.

Comparison of Costs. While these rates of wear and replacement costs may appear high to many who are operating smaller units on clean distillate fuels, the attached table (Table IV) of comparative operating and maintenance costs between a 13,500 hp. diesel generating plant burning a fairly heavy straight run residual fuel oil and a 15,000 kw., 600 psi. steam-electric generating plant burning coal on stokers, and located in the same geographic area may be interesting, to illustrate where the major differences in cost appear. Data taken for the comparison was from annual operating reports of each plant and while there may be some variable factors which would affect the comparative figures slightly one way or another, it is believed that they are reasonably representative of each plant's operating costs, and are shown to illustrate a point. It will be noted that the average maintenance cost per kwh. generated for each plant over a period of 6 years is very close. For the steam plant the cost was .00055 and for the diesel plant .00053. The labor cost for operating is also reasonably close. For the steam plant the cost per kwh. was .00135 and for the diesel plant .00134 (probably reflecting a difference in wage scales). However the 6 year average fuel cost per kwh. generated for the steam plant was .00431 and for the diesel plant .00495. This difference in fuel cost confirms the author's contention that, generally speaking, if the heavy duty, larger sized diesel engine plant is to operate competitively with a fairly efficient steam plant it must look to its fuel cost more closely. The diesel has been improved to where one or two more kwh. can be generated from a gallon of fuel than was possible a few years ago but unfortunately this has generally been possible by using a lighter higher priced fuel oil. In many cases the increased cost of fuel has more than offset the increased economy.

It would seem, therefore, that where lower priced btu. gas is not available that the larger plant must necessarily look to the heavy, lower cost fuel oils. This using of lower priced, more viscous fuel is not a new idea to most operators and to burn it under conditions as we know them today means more maintenance and even lower kwh. output per gallon in some instances. But the ultimate goal of the plant operator who is interested in the economics

of the situation is to obtain a low total cost kwh. on the switchboard.

From a study of the attached Table IV, of cost, it will be noted that the maintenance cost per kwh.

of the diesel plant is in tenths of a mill per kwh. while the fuel cost is in mills per kwh. It will also be noted that the total maintenance cost of the plant was \$15,673 for 1948, while the fuel was \$200,567.00. For the 25,688,670 kwh. generated the

TABLE IV STUDY OF OPERATING COSTS

PLANT "A" 600 Psi COAL BURNING STEAM PLANT 15,000 Kw.
vs.

PLANT "B" HEAVY FUEL OIL DIESEL ENGINE PLANT 13,500 Hp.

| | | 1943 | 1944 | 1945 | 1946 |
|-----------------------------|---|--------------------------------|------------|------------|------------|
| Total Power Gen. | A | 28,321,382 | 31,467,000 | 29,951,800 | 32,060,700 |
| Total Power Gen. | B | 15,913,000 | 16,332,400 | 16,620,700 | 18,359,400 |
| Cost of Fuel | A | \$ 91,386.09 | 107,528.90 | 115,351.25 | 130,233.75 |
| Cost of Fuel | B | 62,569.77 | 69,186.64 | 67,928.11 | 74,149.27 |
| Tons Coal Used | A | 17,221 | 19,142 | 19,402 | 21,590 |
| Gals. Oil Used | B | 1,421,897 | 1,446,219 | 1,407,844 | 1,567,550 |
| Lbs. Per Kwh | A | 1.22 | 1.22 | 1.296 | 1.347 |
| Kwh per Gal. | B | 11.19 | 11.29 | 11.80 | 11.71 |
| Fuel Cost per Kwh Gen. | A | \$ 0.00322 | .00341 | .00385 | .00406 |
| Fuel Cost per Kwh Gen. | B | \$ 0.00392 | .00423 | .00408 | .00404 |
| Fuel Cost per Kwh | A | Average \$0.00431 (For 6 yrs.) | | | |
| Fuel Cost per Kwh | B | Average \$0.00489 (For 6 yrs.) | | | |
| Max. Kw Peak | A | 7,000 | 8,400 | 8,400 | 8,800 |
| Max. Kw. Peak | B | 3,800 | 4,200 | 3,950 | 5,000 |
| Average Load Kw | A | 3,245 | 3,802 | 3,657 | 3,907 |
| Average Load Kw | B | 1,815 | 1,852 | 1,900 | 2,108 |
| Load Factor % | A | 46.36 | 45.26 | 43.54 | 44.40 |
| Load Factor % | B | 47.7 | 44.4 | 48.2 | 42.16 |
| Production Exp. Less Maint. | A | \$ 140,785 | 155,084 | 165,718 | 185,586 |
| Production Exp. Less Maint. | B | 93,310 | 104,375 | 101,406 | 113,958 |
| Production Exp. per Kwh | | | | | |
| Less Maint. | A | \$ 0.00497 | .00492 | .00553 | .00578 |
| " " " " | B | 0.00586 | .00639 | .00610 | .00620 |
| " " " " | A | Average \$0.00595 (For 6 yrs.) | | | |
| " " " " | B | Average \$0.00699 (For 6 yrs.) | | | |
| Power Plant Maint. | A | \$ 8,280 | 16,020 | 20,931 | 13,265 |
| Power Plant Maint. | B | 3,108 | 7,566 | 5,024 | 15,478 |
| Maint. Cost per Kwh | A | \$ 0.00029 | .00050 | .00069 | .000413 |
| Maint. Cost per Kwh | B | 0.00019 | .00046 | .00030 | .00084 |
| Maint. Cost per Kwh | A | Average \$0.00055 (For 6 yrs.) | | | |
| Maint. Cost per Kwh | B | Average \$0.00053 (For 6 yrs.) | | | |
| Oper. Labor per Kwh | A | \$ 0.00120 | .00122 | .00138 | .00144 |
| Oper. Labor per Kwh | B | \$ 0.00117 | .00136 | .00133 | .00141 |
| Oper. Labor per Kwh | A | Average \$0.00135 (For 6 yrs.) | | | |
| Oper. Labor per Kwh | B | Average \$0.00134 (For 6 yrs.) | | | |

fuel purchased was 2,153,105 gallons of oil. Suppose that just one cent per gallon was to be spent to obtain a more desirable fuel oil from a maintenance standpoint. This would cost an additional \$21,531.05 or \$5,458 more than the total cost of all engine maintenance. Maintenance costs are undoubtedly important in the operation of a plant and must be watched closely, but from a cost per kwh. at the switchboard basis, the price of fuel is of far greater significance. There is a definite need for more thought to be given by operators and more especially by manufacturers to the use of lower grade, lower cost fuels in large diesel engine plants for power generation.

Writer's Comment. The foregoing discussion by Supt. Sims of the Grand Haven, Michigan Municipal Plant is very enlightening and should be of interest to all of our readers. Inasmuch as the writer and Mr. Sims have both conducted somewhat similar tests along practically the same lines it will be interesting to note a comparison of these tests in two entirely different plants, especially since our results are somewhat different than those procured by Mr. Sims and while we did not go into as elaborate a test with varying grades of lubricants, we did find that there were several factors, not mentioned by Mr. Sims, which had a very definite result on maintenance costs. These will be discussed in the next issue of DIESEL PROGRESS, and an accumulation of results obtained on both tests will give our readers some valuable data on which to base their opinions of these various factors affecting maintenance costs.

Oyster Harvester ROWE



The Rowe, most modern of oyster harvesters, is owned and operated by H. C. Rowe & Company of New Haven, Conn. It is a converted Army freight supply vessel 114 feet long, powered by National Supply Co. twin 11½x15-in. Atlas Imperial marine diesel engines. Average speed is 11 to 12 knots. Once put in operation, the dredging equipment virtually runs by itself and can harvest 1,000 bushels of oysters hourly. Cargo capacity of the vessel is 3,000 bushels. Dredge blade and nozzle, built similar to a vacuum cleaner has an opening 6 feet wide and 7 inches high. Traveling along the ocean bed behind a rubber tired dolly attached to the vessel, the nozzle picks up everything it passes, including oysters, starfish and oyster drills, one of the greatest pests in oyster cultivation. The nozzle connects to a 40-ft. steel lead pipe through a 20-ft. length of 10-in. suction hose manufactured by the B. F. Goodrich Co.

Suction comes from a 3600-gpm., 180-ft. head centrifugal pump discharging through an eductor, which creates enough vacuum to lift 2400 gpm. of water and oysters. Discharge is directed to a moving wire-screen conveyor that catches the

oysters, etc., and carries them to the loading space. The water is diverted back to the ocean over stainless-steel watersheds. A bucket and belt conveyor system unloads the vessel onto a dock conveyor that feeds the processing plant. Using the Rowe in clearing a 40-acre bed being prepared to receive oyster seed, the vessel caught and destroyed more than 500,000 oyster drills. The owners believe they can virtually eliminate this pest from their setting and growing beds, thereby doubling the yield of marketable oysters.

Schools for Operators

The following six schools have scheduled short courses for 1952 for men who now operate diesel

engines in these states. These conferences are being set up by the Engineering Extension Department of the schools sponsoring them. University of Kansas, Lawrence, Kansas—Thursday, Friday, Saturday, May 15, 16, 17; Iowa State College, Ames, Iowa—Monday, Tuesday, Wednesday, July 21, 22, 23; University of Nebraska, Lincoln, Nebraska—Thursday, Friday, Saturday, October 16, 17, 18; University of Missouri, Columbia, Missouri—Monday, Tuesday, Wednesday, October 20, 21, 22; University of Illinois, Monticello, Illinois—Monday, Tuesday, Wednesday, October 27, 28, 29; Oklahoma A. & M. College, Stillwater, Oklahoma—Monday, Tuesday, Wednesday, November 17, 18, 19. Naturally DEMA is doing all possible to help make these sessions successful.



★ ★ ★

**BRIGGS OIL CLARIFIERS
ON STATIONARY-TRANSPORT-MARINE
DIESELS PAY OFF BIG..**

**... BECAUSE THEY KEEP
LUBE OIL CLEAN—PHYSICALLY AND CHEMICALLY!**

100% BRIGGS IS PROOF!

The Transcontinental Gas Pipe Line Station at Ellicott City, Maryland, is one of many installations 100% Briggs equipped. Yes, actually, wherever diesel or gas engines are used, operating men have proved over the years that Briggs Oil Clarifiers are superior—keep lube oil clean at less cost—engines run better.

**BRIGGS HAS THE RIGHT FILTER
FOR EVERY DIESEL ENGINE**

**WOULD YOU LIKE
TO HAVE YOUR
PRESENT FILTERED
OIL CHECKED?**

Send us a sample and full engine data. We will put it through our laboratory and give you the report. If new filters are needed, we will recommend type and size.

★ A Briggs Catalog belongs in your file—write for one NOW!



**THE BRIGGS FILTRATION COMPANY
RIVER ROAD, WASHINGTON 16, D. C.**



Model D-8-88-5V4
One of seven Briggs Oil
Clarifiers at Transcontinental
in Ellicott City

FOR MORE THAN A QUARTER CENTURY



WHAT'S GOING ON IN ENGLAND

CONDUCTED BY HAMISH FERGUSON

Hamish Ferguson was appointed secretary to the Diesel Engine Users Association in London in 1944. Previously senior technical assistant to Diesel and Insurance Consultants, London, and for several years with English Electric Company in the designing and erection of large diesel generating plants. Mr. Ferguson continues to do independent consulting work.

A considerable amount of experimental work has now been carried out on diesels in connection with the use of boiler oil having a viscosity range of 1,500 to 3,000 secs. Redwood No. 1 at 100°F. The first engines to be tried out in England were of the large marine type, and the results were most encouraging. At the present time there are some 500 such engines either in service, or in process of conversion, or under construction. Initial difficulties were soon overcome and the essentials to success were proved to be the adequate clarifying of the fuel and its preheating to the correct temperature before introduction to the engine.

Following the success achieved on the larger engines, it was natural to turn attention to the smaller auxiliaries with a view to using the same grade of fuel throughout the ship. Due to the higher rotational speeds it would be anticipated that the problem might be more difficult but a number of manufacturers felt that it should be tackled since, if good results could be obtained, the application of the use of the cheaper fuel would benefit not only marine engineers but users of stationary engines also.

Mr. J. Smith, chief engineer for the National Gas and Oil Engine Co., Ltd., recently gave some account in "The Motor Ship" of his Company's experimental work on the utilization of heavy fuels. The engine selected for the tests was a single-cylinder four-stroke with direct injection and a

four-valve cylinder head; 9 in. bore x 12 in. stroke, operating at 500/600 rpm. An electrically-driven Roots-type blower was used for supercharging. Preheating of the fuel was arranged by fitting an immersion heater in the fuel tank and by continuous pumping through a ring main which supplied the fuel pumps, the excess being returned to the tank. Optimum preheating temperatures were found to be 160°F., 180°F. and 210°F. for fuels having viscosities of 600, 1,500 and 3,000 secs., respectively; these temperatures were in each case equivalent to a viscosity of about 130 secs. at the fuel pump. The fuel was clarified and separated in one operation by a centrifuge at the rate of approximately 12 gal./hour (about 1/20 of the machine's capacity). Under these conditions the water content was reduced from 1.5 per cent to 0.03 per cent (by volume) and the sediment from 0.08 per cent to 0.01 per cent (by weight). The lubricating oil used throughout was a straight mineral oil of SAE. 30 grade.

The primary objects of the tests were to examine the combustion efficiency and to determine the cylinder wear rate when operating on the heavy fuels. Test procedure consisted of a preliminary run of 150 hours on gas oil to neutralize high initial wear rates and to run-in the piston rings and thus stabilize the lubricating oil consumption. The engine was then put on a 1,500 secs. oil for nearly 200 hours. On withdrawing the piston it was found to be extremely dirty and it appeared that the

cylinder wear rate had been heavy. After cleaning of the piston and atomizer the run was resumed until a total of 500 hours had been reached. At this stage cylinder wear measurements were taken. During the first stage of 500 hours the engine was run on a steady load of 50 bhp. at 600 r.p.m., equivalent to 86.5 psi. The second stage consisted of a further 500 hours run on a varying load cycle as shown in Fig. 3. At the conclusion of the second stage the piston was examined and its condition and that of the rings was good, carbon deposits being no worse than would be

... and now please turn to page 62 ...

Fig. 3.

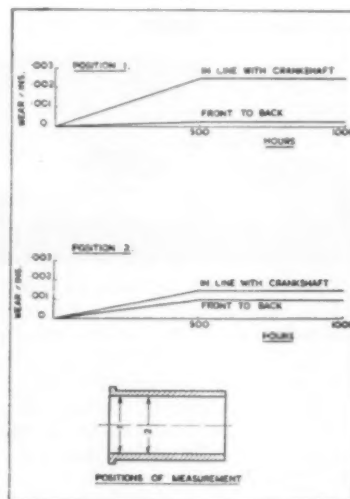
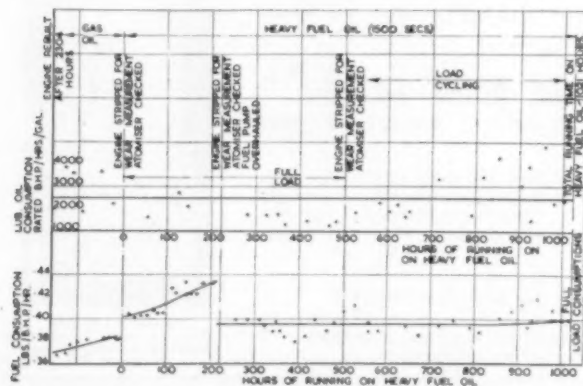
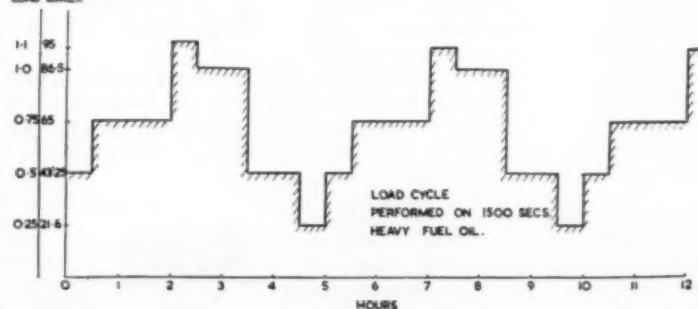


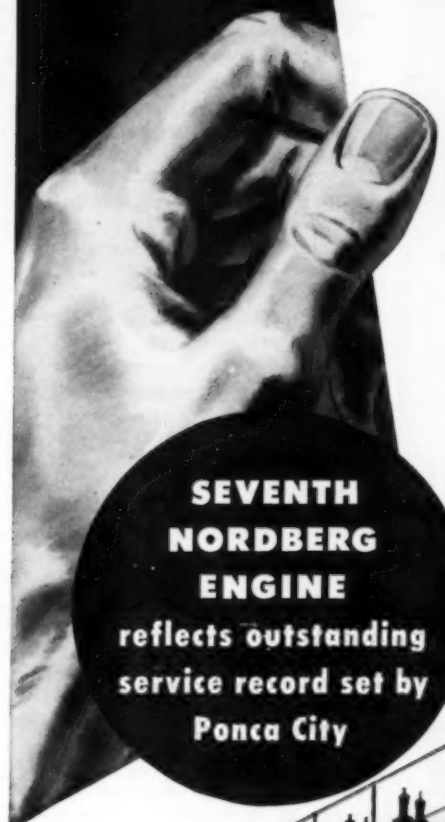
Fig. 1.

Fig. 2.



LOAD BMEP





**SEVENTH
NORDBERG
ENGINE**
reflects outstanding
service record set by
Ponca City



MUNICIPAL BUILDING
CITY OF PONCA CITY
PONCA CITY, OKLAHOMA

Mr. R. W. Bayerlein
Nordberg Mfg. Co.
Milwaukee, Wisconsin

Dear Mr. Bayerlein:

Just a note to let you know that our plant is running fine. We have pulled the heaviest electric load in the history of our plant during the past three months. Hot weather hit here about June 15 and air conditioners and fans together with an increased seasonal load taxed our plant and electric system to capacity and over. We can pull roughly 7000 kilowatts with all Nordberg engines running and take care of the swings, etc. This summer we had 7300 kilowatts for hours every day and with an outside temperature of 100 to 108 degrees generating a total of 3,301,000 kilowatt hours for the month.

The 3600 hp Nordberg gas burning engine was kept on the line for 24 months non-stop 2500 Kw steady load. The other two Nordberg gas Diesels were loaded to 1350 and 1100Kw respectively leaving 2350 Kw for the 3 old "80" Nordberg Diesel engines. Remember one of these 800 Kw engines is 28 years old. (they still pull their rated load with the original economy).

We have certainly put these Nordberg engines on a long hard test and the results are very gratifying.

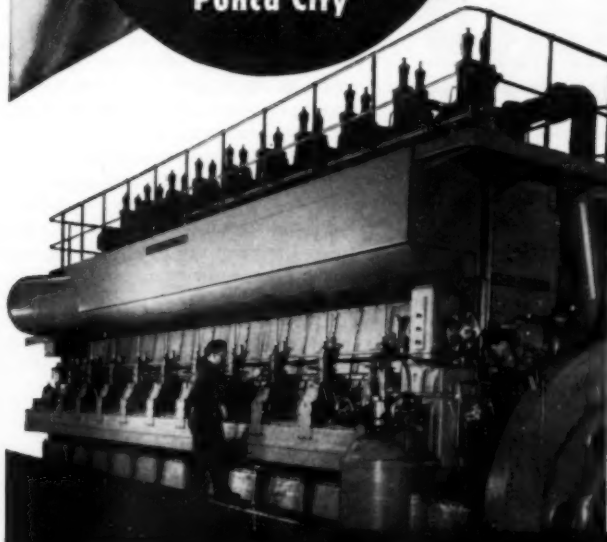
It might be of interest to know that last year our plant cost including depreciation was about \$4 mills. this year with the increased load we are doing still better.

Yours truly,

Pat Schlesinger

Pat Schlesinger, Supt.

PS/na



AS Mr. Schlesinger's letter points out, Ponca City, Oklahoma, has set an impressive record for dependable, economical power production . . . thanks to sound, efficient management and the reliable, low cost operation of Nordberg Diesel and Duafuel power.

Having originally installed 4 Nordberg oil burning Diesels, this progressive plant was one of the first to turn to low cost natural gas, putting into service a 2,400-hp. Nordberg Duafuel engine in 1947. Next, one of the original Diesels which had been in service since 1937, was converted and began burning gas in December, 1947. In May, 1949, a new 3,600-hp. Nordberg Duafuel engine was put on the line, which brought total plant capacity to 12,000 hp., of which gas engines made up 8,250 hp.

With this successful background, it was natural that when Ponca City needed more power, officials again turned to Nordberg . . . and ordered a new 4,275 hp. Duafuel unit—their seventh Nordberg Engine.

NORDBERG MFG. CO., Milwaukee, Wisconsin

P232



A DIVISION OF NORDBERG

NORDBERG
DIESEL ENGINES



THOMAS

Flexible ALL METAL COUPLINGS

FOR POWER TRANSMISSION
REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for misalignment and end float.

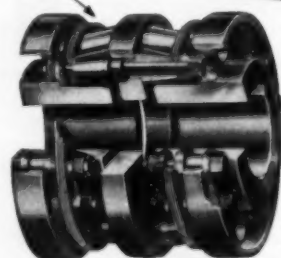
Thomas Couplings have a wide range of speeds, horsepower and shaft sizes:

1/2 to 40,000 HP
1 to 30,000 RPM

Specialists on Couplings for more than 30 years

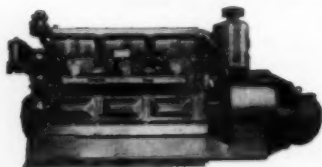


PATENTED FLEXIBLE DISCS



THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT. NO MAINTENANCE PROBLEMS.

ALL PARTS ARE SOLIDLY BOLTED TOGETHER.



FOR SUCH TOUGH JOBS AS: DIESEL COMPRESSOR DRIVES, MARINE MAIN DRIVES, LOCOMOTIVE MAIN DRIVES, AUXILIARY DRIVES, ETC.

Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

The Budd RDC Diesel Car Cooling System

A unique cooling system is used in the Budd RDC self-propelled diesel car. The chief purpose in this system is to prevent the water in the radiators from freezing in cold weather operation. This is accomplished by either passing all of the water through the radiators when required, or passing no water through the radiators when cooling is not required.

Figure A shows the water flow when the water tem-

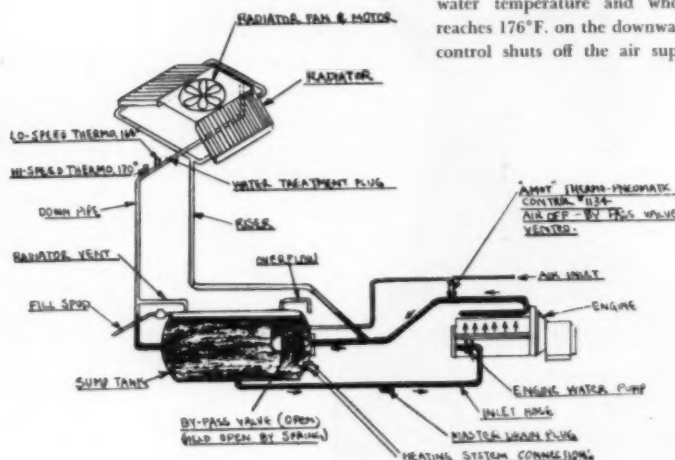


Figure A. Budd engine cooling system with water temperature below 176°F.

perature leaving the engine is below 176°F. The "Amot" #1134 thermo-pneumatic control is screwed directly into a 1 1/4-inch half coupling in the engine outlet line on the latest cars built. When the temperature is below 176°F. the "Amot" control bleeds any air from the air actuated by-pass valve. In Figure A, the by-pass valve is held open by its spring pressure holds it open. Therefore, the water goes from the sump tank to the engine. Then, it leaves the engine and goes directly back to the sump tank and no water is circulated to the overhead radiators. As this process

continues, the water temperature gradually rises due to heat dissipation of the engine.

The "Amot" control introduces air into the by-pass valve which closes it rapidly when the water temperature leaving the engine reaches 176°F.

Then the water flow is as shown in Figure B. Water is drawn from the sump tank by the engine water pump. However, after the water leaves the engine, it goes to the radiators overhead and then back to the sump tank. This process gradually reduces the water temperature and when the temperature reaches 176°F. on the downward cycle, the "Amot" control shuts off the air supply and bleeds the

by-pass valve which causes it to open. The overhead radiators are rapidly drained and freezing is prevented at the same time.

Figure A shows the Lo-Speed and Hi-Speed thermostats on the radiator outlet line. This is a refinement to obtain closer regulation of temperature and to provide the necessary cooling capacity. The Lo-Speed thermostat switch cuts in when the temperature reaches 165°F. and causes the electrical fan to rotate at its slow speed. When the temperature from the radiators reaches 170°F., the Hi-Speed thermostat switch cuts in and causes the radiator fan to rotate at high speed.

The "Amot" controls mentioned in the article are manufactured by American Motors Company, 21 Nevin Avenue, Richmond, California.

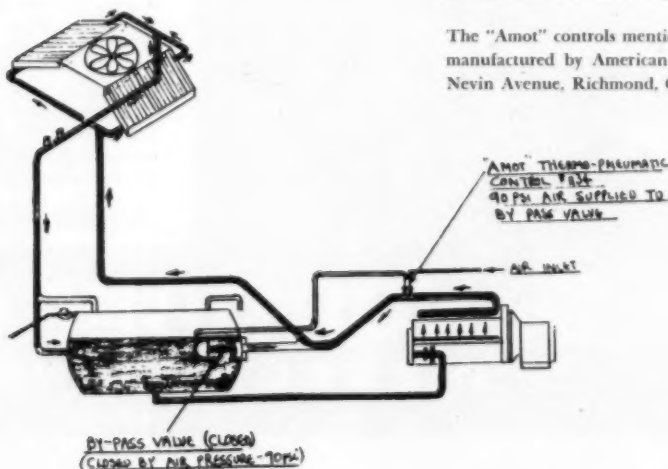


Figure B. Budd engine cooling system with water temperature above 170°F.

Short Courses for Diesel Operators

Following is a list of the seven schools that are going to hold short courses within the next few months for operators of diesel engines in their territory. The individual named will be in charge. At the University of Kansas, Lawrence, Kansas, May 15, 16, 17, David V. Breidenthal, assistant to the Dean (University Extension); at the Iowa State College, Ames, Iowa, July 21, 22, 23, Prof. G. Ross Henninger, assistant director, Engineering Extension Service; at the University of South Dakota, Vermillion, South Dakota, August 5, 6, 7, Prof. H. E. Brookman, Extension Division; at the University of Nebraska, Lincoln, Nebraska, October 16, 17, 18, Robert A. Ratner, engineering specialist (University Extension); at the University of Missouri, Columbia, Missouri, October 20, 21, 22, Prof. R. T. Quick, Engineering Extension Service, 232 Engineering Building; at the University of Illinois, Monticello, Illinois, October 27, 28, 29, R. K. Newton, conference supervisor, University of Illinois, 725 S. Wright St., Champaign, Illinois (meeting to be held at Robert Allen Park, Monticello, Illinois); at the Oklahoma A. & M. College, Stillwater, Oklahoma, November 17, 18, 19, Prof. W. H. Easton, Department of Mechanical Engineering.

A small registration fee will be charged by each of these schools. The enrollment is not limited to the states in which the schools are located. This offers an opportunity for those in adjoining states to also attend.

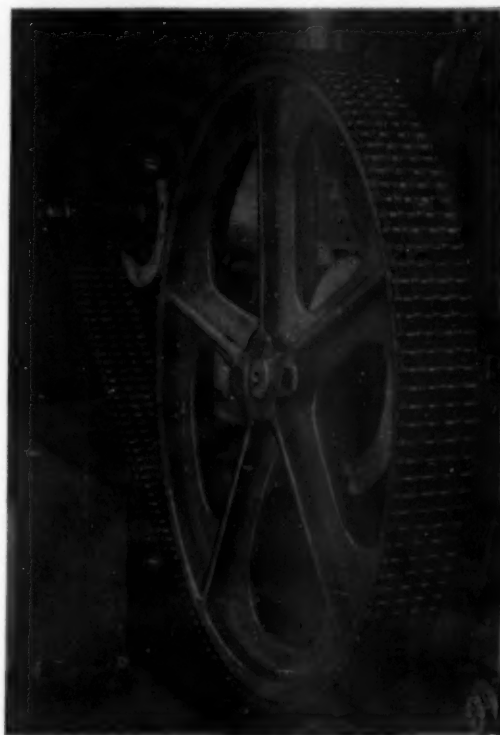
The subjects to be covered in these short courses include fuel injection systems, dual-fuel and gas diesel engines, intake and exhaust systems, lubricating problems and lubricants, fuel injection equipment and problems, fundamentals of combustion, cooling equipment and problems, analysis of indicator cards and the importance of keeping accurate engine data, pistons and piston rings, filters, building and plant design, bearing failures, engine silencing, governors and speed drop, crankcase explosions and prevention, preventive maintenance on both diesel and electrical, safety, good housekeeping, economies of operation, recent and future developments in diesel engines, waste heat recovery, and color coding and color dynamics.



Prof. B. S. Davenport

The Diesel Engine Manufacturers Association has employed Professor B. S. Davenport of Oklahoma A. & M. College to attend these short courses and assist in any that he can help to make the programs most successful. After the various meetings have been completed, he will prepare an overall report which will be of great help to the schools in the future in conducting these courses. Professor Davenport is on the staff of the Mechanical Engineering Department at Oklahoma A. & M. and has been active in helping with the short courses his school has conducted for operators in the state. Incidentally, this school pioneered in developing this idea of a school for diesel operators.

Simplify Power Take-Off for Excavators and Engine Compounding



WITH DIAMOND ROLLER CHAINS

• Lightweight yet rugged Diamond Roller Chains for power take-off give a high efficiency power transfer direct from power source.

Shafts can be far apart or close together; speed ratios present no problem; there is no slip or creep and, installing, removing or replacing chains requires no major dismantling.

Diamond Roller Chains operate at all speeds up to 8000 r.p.m. and in capacities from a fraction h.p. to thousands . . . For smoother, longer life, greater simplicity — decide now to investigate the many advantages of Diamond Roller Chains. Practical suggestions by Diamond engineers can help save your time.

DIAMOND CHAIN COMPANY, Inc.
Dept. 407, 402 Kentucky Avenue • Indianapolis 7, Indiana

Engine Power
Take-Off



Compounding engine
power on modern oil
drilling rig.

DIAMOND

ROLLER
CHAINS

England

... continued from page 58 ...

expected when operating on gas oil under similar conditions. Cylinder wear measurements were also taken and details are shown in Fig. 1. In Fig. 2 are set out full particulars of the results obtained throughout the 1,000 hour test.

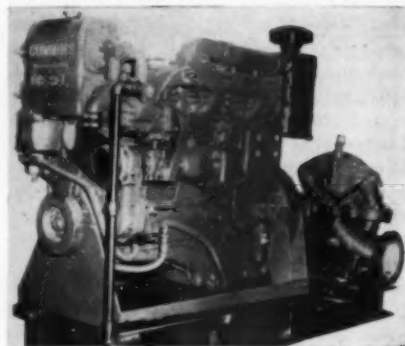
Mr. Smith concluded his report by saying, "The control of the engine conditions together with the clarifying and separating of the fuel has improved the engine performance both from the aspect of wear and deposits. It will be noted that the wear of the cylinder liner during the last 500 hours is very small and over the full 1,000 hours the maximum wear is 0.0025 in. This wear is not excessive

when it is considered that during the 1,000 hours the number of starts from cold was 120. A full picture of liner wear and engine performance over the 1,000 hours is given in Figs. 1 and 2. From these tests it appears that by controlling engine conditions the wear rates can be reduced to those expected from an engine running on gas oil. There appears to be no real necessity so far to use a detergent lubricating oil, all the above tests having been carried out using an SAE. 30-grade straight mineral oil.

It will be appreciated that the tests are incomplete and work is still proceeding. Conclusions as to the satisfactory operation of engines on boiler oil are, therefore, at the moment, difficult to ar-

rive at; but it can be said that the indications are that there will not be any major difficulties to overcome in operation. Whether the saving in fuel costs will more than wipe out the undoubted increase in maintenance costs will only be known when engines have been operating under service conditions over a long period."

Approved for Fire Protection Service



Three models of Cummins diesels coupled to Peerless fire pumps have been approved for fire protection service by Factory Mutual Laboratories, of Boston, Mass. This testing group now lists the 150-hp. Model HI-600-F, the 200-hp. Model NHI-600-F, and the 275 hp. Model NHS-600-F, manufactured by Cummins Engine Company, Inc., at Columbus, Ind., together with the models of Peerless Pumps they power, in the manual, "Approved Equipment for Industrial Fire Protection." All Cummins diesels listed by Factory Mutual were previously approved by Underwriters' Laboratories, Inc., another nationally known insurance testing agency. Factory Mutual tested the three Cummins diesels with Peerless Pumps and gave the units the following ratings and capacities:

| Cummins Diesel | Peerless Pump | Pump Capacity | Head | RPM. |
|----------------|---------------|---------------|---------|------|
| HI-600-F | 5" AF-10 | 1,000 gpm. | 125 lb. | 1750 |
| NHI-600-F | 6" AF-15 | 1,500 gpm. | 100 lb. | 1750 |
| NHS-600-F | 8" AF-20 | 1,000 gpm. | 100 lb. | 1750 |

According to the Laboratories' report, the three units tested were given an endurance test of eight hours, during which frequent readings were taken of speed, discharge, head, fuel oil pressure, lubricating oil pressure and temperature, jacket water temperature, cooling water inlet and outlet temperature, cooling water rate in gallons per minute and generator charging rate. The units were run continuously at rated capacity for two hours and at 150 per cent capacity for two hours. The report also stated that dynamometer tests were run on all three pumps.

All Cummins diesels for this type of service are equipped with a heat exchanger, oil cooler, instrument panel, tachometer, hour meter, 24-volt electric generating and starting systems, cooling water pump and other special accessories as may be needed by the installation. Factory Mutual Laboratories is the testing organization for Associated Factory Mutual Fire Insurance Companies. These insurance companies (of which there are nine) specialize in insurance protection for manufacturing plants and other large properties against fire, explosions, wind damage, and other losses.

CHECK THESE ADVANTAGES IN COOLING DIESELS-



with *"Buffalo"* EVAPORATIVE COOLERS

✓ Water jacket temperatures kept to within a very few degrees of setting
✓ Closed system cooling means CLEAN cooling!

✓ Uses little water!
✓ Minimum space required!
✓ Easy Operation and Maintenance!
✓ Indoor or outdoor installation!

Quality Construction Insures Performance!

Look at this quality construction in "Buffalo" Evaporative Coolers—efficient Aero-fin spiral-fin cooling coils—efficient "Buffalo" wheel, hollow-shaft "mixed-flow" fans for quiet, high volume air delivery—durable "Buffalo" pumps—non-clogging spray nozzles also by "Buffalo"—construction that means dependable operation and freedom from troubles, year after year. WRITE FOR BULLETIN 3666 and check all specifications, including the 3-sectional design that permits moving units thru standard doorways!

BUFFALO FORCE COMPANY

536 BROADWAY

FIRST
FOR FANS

BUFFALO, NEW YORK

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont. Sales Representatives in all Principal Cities

EVAPORATIVE COOLERS AND AXIAL FLOW FANS FOR COOLING MOBILE AND STATIONARY DIESELS

EMD Shifts Personnel



W. N. Fritts

G. M. La Riviere

Promotion of Walter N. Fritts to general sales manager of Electro-Motive Division, General Motors, has been announced by Paul R. Turner, director of sales. Mr. Fritts succeeds O. F. Brookmeyer who has been placed on special assignment. Other moves by Mr. Turner, which complete organizational changes in the wake of the appointment of Mr. N. C. Derendorf, former director of sales, as general manager, follow: Division of the Eastern Region, formerly headed by Mr. Turner himself, into two new regions. One will be at New York, still known as the Eastern Region, to be headed by G. M. La Riviere who is transferred from manager of the St. Louis region.



R. L. Terrell

F. W. Walker, Jr.

The other will have headquarters at Washington, D. C., be known as the Southeastern Region and will have R. L. Terrell, former assistant manager of the Eastern Region, as manager. Frederick W. Walker, has been shifted from district sales manager, Chicago region to manager, St. Louis region. George W. Rukgaber, from sales manager, East Central district, Chicago region, to sales manager, Western district, Chicago. Floyd E. Von Ohlen, sales representative, Chicago region, to sales manager, East Central district, Chicago.

Catalog Folder Available

A colorful, eight-page catalog folder has been issued by the Electric Service Engineering Co. The publication, liberally illustrated, also includes specification charts and diagrammatic drawings. The company, working to customer's specifications, designs and assembles electrical control and power equipment for portable, stationary diesel, gasoline or other types of generators; power unit substations; synchronizing units and laboratory testing equipment for special applications, automatic start-up controls for standby diesels, and visual and audible gauge and alarm panels.

The Bulletin, entitled "Esco Engineered Switchgear," is available upon request. Concisely written and highly informative, it contains material of interest to engineers and all users of switchgear. Write to DIESEL PROGRESS, File 97, Box 8458, Cole Station, Los Angeles 46, Calif.



Here's low cost *Life Insurance* for diesel engines



NUGENT FILTERS for fuel and lube oil

The amount of protection afforded by fuel and lube oil filters is dependent upon the effectiveness of the filters... and all filters are not equally effective. You'll see what we mean if you'll compare Nugent Filters with any others. By actual test, Nugent Absorbent Oil Filters remove 99.8% of the dirt. Dirt and carbon particles as small as a few microns are removed and prevented from getting to those areas where they can accelerate wear and shorten engine life.

Size for size, Nugent Filters offer greater filtering area. In addition, they make possible a choice of full flow or by-pass filtering with the same unit. Recharges are inexpensive and easy to install. Simple piping makes installation no problem.

Write for descriptive literature that shows how to insure the long life of your diesel.

Three 720 H. P. Cooper — Bessemer Diesel powering the American Barge Line Company's new "Mount Vernon", illustrated above, are equipped with Nugent Filters for fuel and lube oil, helping to assure the owners that they will get all the fine service these engines are designed to give.



Above — One of the Nugent Duplex Fuel Oil Filters installed on the "Mount Vernon." Below — A Nugent Lubricating Oil Filter of the type used on the "Mount Vernon."



Wm. W. Nugent & Co., Inc.
415 N. Hermitage Ave. CHICAGO 22, ILLINOIS

OIL FILTERS, DRAINING AND PURGING SYSTEMS, THERMOSTATS, OILING DEVICES, SIGHT FEED VALVES, FLOW INDICATORS

Representatives in Boston • Cleveland • Detroit • Houston • Los Angeles, Calif. • San Francisco • St. Louis • St. Paul • Toledo • Washington, D.C. • New York • Philadelphia • Portland, Ore. • San Francisco • Seattle • St. Paul • Toledo • Washington, D.C. • New York • Philadelphia • Portland, Ore. • San Francisco • Seattle • St. Paul • Toledo • Washington, D.C.

Publishes New Marine Book

Colorful, complete and compact, the third edition of "Marine Machinery Lubrication" just published by the Marine Sales Division of The Texas Company is an outstanding contribution to marine literature and a "must" for every marine engineer's bookshelf. The 140-page book is not a piece of advertising material in the generally accepted meaning of the phrase, but is a carefully and accurately prepared work on the overall subject of marine machinery lubrication written by engineers for engineers. It is profusely illustrated with photographs, sketches and schematic drawings. Color printing is used extensively to give full clarity to the illustrations. The entire

marine machinery lubrication field is covered from the steering gear to the Skinner Unallow engine, from diesels to deck winches. General chapter headings include: Marine Steam Turbine, Reciprocating Steam Engines, The Gas Turbine, Bowes Electric Drive, Marine Diesels, Auxiliary Lubrication and Rust Prevention.

Comprehensive trouble shooting guides are given for diesel engines and for reciprocating and turbine steam. The back section of the book is devoted to a number of valuable conversion and temperature tables and diagrams.

Engineers wishing to obtain a copy of the third edition of "Marine Machinery Lubrication" may

obtain one by writing on their company stationery to The Texas Company, Marine Sales Division, 135 East 42nd Street, New York 17, N. Y. There is no charge for the book or for postage.

The WEIRITER



The Weirton Steel Company recently took possession of its first towboat, the new 58 ft. x 20 ft. x 6 ft. 3 in. twin screw *Weiriter*. The sturdy workboat will be used in harbor service at the company's Weirton, West Virginia, plant. Designed and built by the St. Louis Shipbuilding & Steel Co., the *Weiriter* embodies the best of modern workboat type design. She closely resembles the towboat *W. J. Kearns*, delivered recently to the Jones & Laughlin Steel Co., and which has already proven itself in service. The rugged hull is constructed on the transverse framing system, with $\frac{3}{4}$ in. bottom, side and bilge plating, and $\frac{1}{2}$ in. deck and bulkhead plating. The bow lines are of the modified scow type, fairing aft into twin tunnels. Each tunnel has a Kort Nozzle specially designed to meet the exacting requirements of this type boat. To further increase the push, the *Weiriter* is equipped with a pair of Contraguide rudders for which St. Louis Ship has the inland river manufacturing rights. Since the vessel will be used primarily for shifting barges at the Weirton plant, the pilot house was made particularly high to afford the pilot clear vision over eight coal barges. Propulsion is provided by two Caterpillar Model D364, 60° V8 arrangement, eight cylinder, four-stroke cycle, valve-in-head diesel engines. The engines are rated at 215 hp. each at 1200 rpm. With Snow-Nabstedt 3.9 to 1 reverse-reduction gears, the 54 in. diameter cast steel propellers are turned at 308 rpm. at full power. Air starting motors provide for starting while all engine controls are from the Pilot House.

Air for the clutches and main engine starting is provided by a 12 cfm. Gardner-Denver air compressor. A 15 hp. 500 gpm. Fairbanks, Morse pump is installed as a combination fire and bilge pump. The vessel is equipped with a St. Louis Shipbuilding & Steel Co. Steering System, consisting of two hydraulic cylinders, two Vickers hydraulic pumps (one driven by a 3 hp. motor and one driven off a stub shaft on the port main engine), control valves and follow-up controls. The steering system actuates two steering rudders and four flanking rudders.



DIESEL PROGRESS

SO MUCH DEPENDS ON IT!

IN YOUR BUSINESS . . .

Quincy
COMPRESSORS FOR DEPENDABLE
COMPRESSED AIR SUPPLY

There is nothing more important to success than dependability. That's why hundreds of businesses employ Quincy Compressors to deliver the required compressed air supply for their various jobs. Modern, compact, and rugged . . . Quincy Compressors can be counted on when needed.

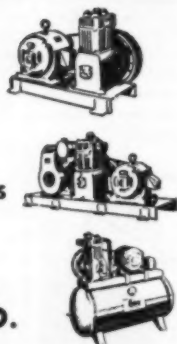
There's a Quincy Compressor for *your* job! Depend on a Quincy specialist to help you select the type and size (from 1 to 90 c.f.m.) to meet your specific needs. Write Dept. K-24 for details.

Only Quincy OFFERS ALL THESE FEATURES

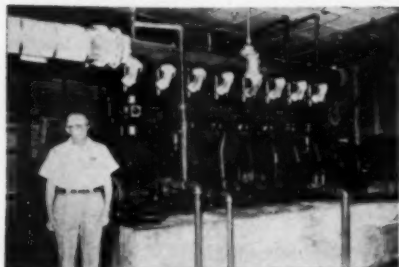
- Timken Bearings
- Lynite Rods
- Perfectly Balanced Crankshaft
- Copper-Finned Intercooler
- Automatic and Positive Lubrication

QUINCY COMPRESSOR CO.
QUINCY, ILLINOIS

Branch Offices: NEW YORK • PHILADELPHIA • DETROIT • CHICAGO • ST. LOUIS • DALLAS • SAN FRANCISCO
Quincy Manufactures Air Compressors Exclusively



Low Cost Pumping



Superintendent M. H. Coon of Santa Cruz Farms and one of the Atlas natural-gas engines used for pumping irrigation water.

Santa Cruz Farms, a division of D'Arrigo Bros. of California, with wholesale terminals in New York and Boston, farms over 1100 acres near Eloy, Arizona, to produce vegetables, alfalfa and cotton. In this arid region, you cannot take a chance on water; the source of supply must be dependable, and the method of delivery must be sure. Santa Cruz Farms assured itself of a source by drilling three deep wells and, to provide sureness of supply, equipped each well with a National Supply Co. Atlas Model 45, natural-gas engine driving a Wintroath deep-well pump. Two of the pumps use flat-belt drive while the other is driven through a Johnson Model HJ-300 gear head. The first engine was installed in 1949, the second in 1950 and the third in 1951. According to Mr. M. H. Coon, superintendent, "The unit installed in 1949 has operated a total of 12,400 hours with total operating costs averaging only 86 cents an hour. Maintenance on this engine has been nominal—changing spark plugs every three months."

Changes Name to Worthington Corporation

Stockholders of Worthington Pump and Machinery Corporation at their annual meeting re-elected their present board of directors and voted to change the company's name to Worthington Corporation. "While we are proud of the fact that the name 'Worthington' has meant 'pumps' to the world at large for more than a century," said H. C. Ramsey, president, "we are equally proud of the fact that during this same period Worthington has extended its manufacturing activities into many fields with the result that today, with few exceptions, every industrial and commercial enterprise is a potential user of one or more of the many other items of our equipment. Because of our wide diversification we believed that the continued reference to 'pumps' in the corporate name tended to lead the public into the erroneous conclusion that pump manufacture was our only endeavor. Such, of course, is not the case." Mr. Ramsey also stated that no corporation policies or practices will be affected in any way by the name change. Mr. Ramsey pointed out that while Worthington is a leading manufacturer of pumps, nevertheless a major portion of its sales volume is in such varied products as air and gas compressors, diesel and gas engines, air conditioning and refrigeration equipment, steam power generation apparatus, electric motors, generators, and switch gear, V-belt transmission drives, construction equipment, and liquid meters.

Standardaire

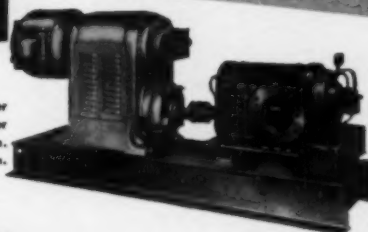
AXIAL FLOW POSITIVE PRESSURE

BLOWERS

provide air to the specific needs of many important industries because Standardaire Blowers are unique in design and construction—unequalled in quality and performance.

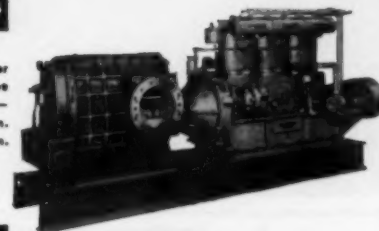
for CHEMICAL PROCESSING

Standardaire Blower with Varidrive Motor to deliver 780 c. f. m. at 1750 r. p. m.



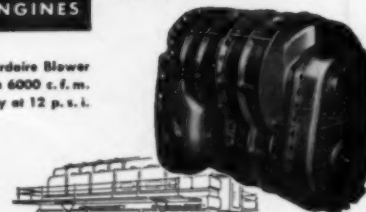
for SEWAGE PLANTS

Standardaire Blower with Climax Engine using sewage gas—to deliver 2100 c. f. m. at 720 r. p. m.

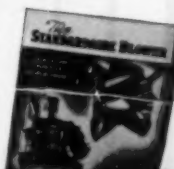


for DIESEL ENGINES

Standardaire Blower with 6000 c. f. m. capacity at 12 p. s. i.

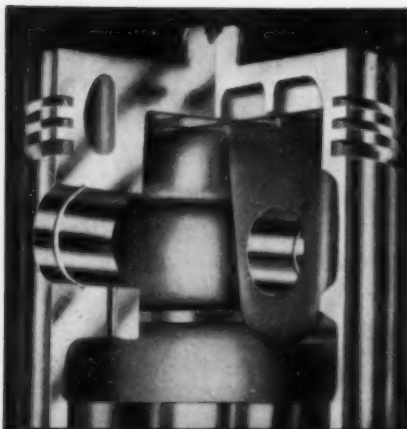


Write DEPT. F23
for Publication No. 90
BLOWER-STOKER DIVISION



READ STANDARD
CORPORATION

370 LEXINGTON AVE., NEW YORK 17, N. Y.

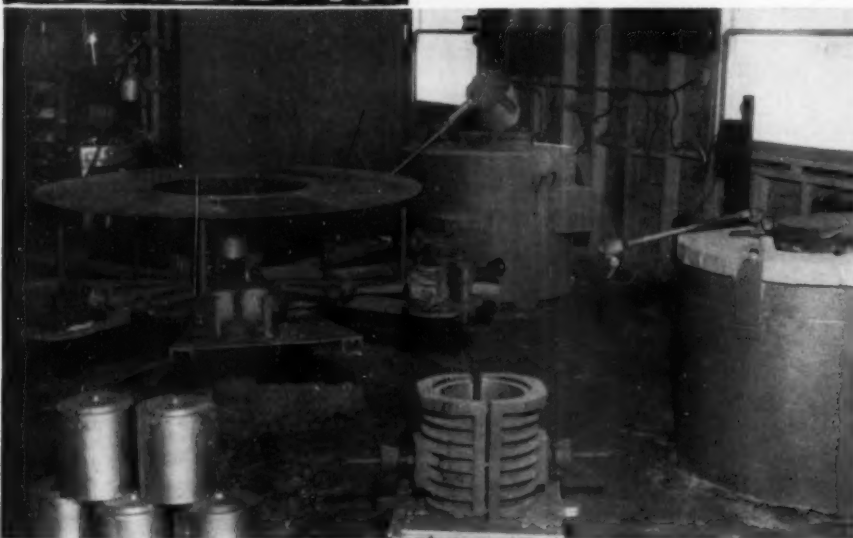


"CUSTOM BUILDING" PISTON CASTINGS

LONGEVITY is a common and expected feature in diesel engines. It is not unusual to find diesels which have been in operation for as long as twenty-five years and still delivering economical and dependable power. Obsolescence is an obsolete word when applied to diesels which have been maintained in good operating order, whether in the oil fields or in industrial and marine applications.

Proper maintenance and proper replacement parts are key factors in diesel longevity. These pay off

Below: One corner of the foundry. Note the thermostat and constant pyrometer. Aluminum alloy is melted down and dipped from same crucible. Crucible is covered. This eliminates agitation and oxidation.



in fewer repair bills and less down-time. One of the main factors in economical fuel and lube oil consumption, not to mention engine efficiency, are the pistons. When an engine is torn down because of piston defectiveness, it is generally necessary that those pistons be replaced. If the model of the engine is not over fifteen years old and if large, over-size pistons are not required, the original manufacturer can usually supply the pistons.

However, when dealing with a model which has not been manufactured for some time, or where large, over-size pistons are required, other sources of supply must generally be sought out. Diesel engine manufacturers in a majority of cases do not carry old model engine parts or stock a large variety of over-size pistons for every possible contingency.

The Bill Jahns Engineering Company, 649 West 17 Street, Costa Mesa, California specializes in casting such "custom-built" pistons. Geared for efficient, economical operation and manned by metallurgical experts, their modern foundry can engineer piston castings from a customer's specifications for a single engine, or in the case of a manufacturer, supply piston castings on a quantity production basis within a week after receipt of the order. Working closely with the metallurgical staff of the Aluminum Corporation of America they employ correct alloys with virgin aluminum poured at low temperatures and correctly heat-treated to produce close-grained, strength-yielding piston castings.

The company is a highly specialized organization operating in a highly specialized field. Their concentration is on engineering the piston, casting the piston, and supplying the customer with a complete machining blueprint in the shortest possible



**USE
MORE OF YOUR
HORSEPOWER
MORE OF THE TIME!
WITH A
TORCON TORQUE**

time. They have found that this proves to be the most economical procedure from the standpoint of the customer since he is usually equipped to do the machining in his own shop at the lowest cost to himself.

Amyl Nitrate

Samples of a new ignition improver for diesel fuel are being made available by Ethyl Corporation for evaluation by the oil industry, it is announced by B. Bynum Turner, vice-president in charge of research and engineering. Ethyl's new fuel additive, he declared, will make it possible for refiners to improve the cetane number of middle distillates simply and economically, thereby increasing the potential output of desired grades of diesel fuel. The compound consists of a mixture of primary amyl nitrates, which is blended into the finished fuel. As little as one-tenth of one percent, by volume, of Ethyl's ignition improver is sufficient to bring many distillate heating oils within the cetane number range of commercial diesel fuels. Moreover, it is effective in improving the cetane number of all types of diesel fuels, regardless of crude source, refining technique, or sulfur content, it is pointed out. Ethyl's ignition improver promises to be of great assistance to the oil industry in meeting a demand for diesel fuel that has expanded fourfold since 1941, and is expected to double again by 1960, according to Mr. Turner.

It will, he said, enable refiners to supply the required grades of diesel fuel in the needed quantities and at low cost. It will increase the flexibility of refining operations by eliminating or reducing the selective blending now required in many instances in order to produce diesel fuel of the required ignition quality. It will permit the up-grading of some heating oil stocks for diesel fuel purposes, and make possible the marketing of

diesel fuels of more uniform ignition quality. The performance tests being undertaken by the oil industry follow extensive investigations already in progress. These include large-scale service tests by the U. S. Navy, over-the-road tests in diesel trucks, and full-scale tests in the Ethyl Research Laboratories in Detroit. If the Navy's tests, in progress since last August, confirm expectations, the Navy will be able to use a wider range of diesel fuel for its surface and underwater craft than at present, according to Mr. Turner, and may be able to use foreign sources of diesel fuel which do not now meet U. S. specifications.

Ethyl's new cetane improver has been developed as an answer to a major problem that has accompanied the spectacular growth in diesel fuel demand, Mr. Turner pointed out. Before World War II, the available supplies of selected straight run distillates were sufficient to meet the prevailing demand for diesel fuel. Since then, however, not only has diesel fuel consumption quadrupled, but competing demands for the middle distillates—for heating oils, for jet fuels, and as a charging stock for catalytic cracking—have grown apace. Today, the diesel fuels produced in many sections now include substantial quantities of straightrun distillates from naphthenic crudes together with distillates from cracking operations. These distillates are inherently lower in cetane value than straightrun distillates from paraffinic or mixed-base stocks. However, many of these distillates need only to be improved in ignition characteristics in order to make them acceptable as diesel fuels, it is pointed out. Only small amounts of Ethyl's ignition improver, tests have shown, are necessary to bring many distillates within the desired cetane range. On the average, five cetane numbers may be gained in a fuel with the addition of 0.13 volume percent of the ignition improver.

A gain of $2\frac{1}{2}$ cetane numbers, on the average, is obtainable with 0.05 volume percent.

Laboratory tests indicate, Mr. Turner said, that cetane numbers gained with Ethyl's ignition improver are the equivalent of natural cetane numbers, and that this added ignition quality is retained during storage. Besides the many advantages to the oil industry, Ethyl believes that the use of a satisfactory ignition improver, by contributing to more uniform fuel quality, will benefit diesel engine manufacturers. For diesel fuel consumers, the availability of fuel of low pour point and more uniform ignition quality would tend to minimize their cold-weather operation problems, reduce their maintenance costs in some cases, and increase operating economy. Commercial production of Ethyl's ignition improver awaits the outcome of the extensive service tests now underway.

Appointed Supervisor



Martin W. Bever

Appointment of Martin W. Bever as supervisor of GM Diesel Industrial Engines Sales in Michigan has been announced by John R. Earle, president of Earle Equipment Company of Detroit. Mr. Bever was formerly associated with the Detroit Diesel Engine Division of General Motors

where he had a total of twelve years experience with the engine in manufacturing, service and sales training capacities. The Earle Company covers the lower peninsula of Michigan for Detroit Diesel Industrial Sales with representatives in Lansing, Grand Rapids, Kalamazoo, Alpena, Traverse City and Jackson.

Operators of shovels . . . draglines . . . cranes . . . rail cars . . . lift trucks . . . road machinery . . . tractors . . . mining machinery . . . logging equipment . . . oil well rigs are discovering the advantages of **TORCON TORQUE CONVERTERS**. This automatic hydraulic transmission features variable speed and torque ratios, and facilitates the full utilization of your power source throughout the entire range of operation.

TORCON CONVERTERS are available for applications involving horsepower from

30 to 600. They can be furnished with and without cut-off clutches.

TORCON units assure maximum utilization of horsepower, provide for more production at less cost, eliminate shock to powered equipment, reduce operator fatigue and increase the service life of your machinery.

Write today for complete engineering details.



CONVERTER



USE MORE OF YOUR HORSEPOWER

TORCON

CORPORATION

1193 FIFTH STREET
ASHTABULA, OHIO

MORE OF THE TIME

Appointed Works Manager



Albert F. Davis

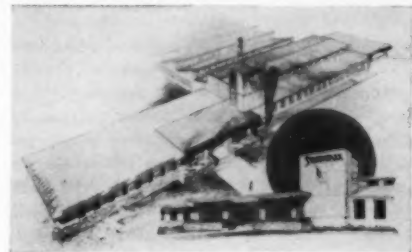
George A. Zink

Albert F. Davis, administrative engineer, Detroit Diesel Engine Division of General Motors, has been appointed works manager. The announce-

ment was made by William T. Crowe, general manager of Detroit Diesel. Mr. Davis as works manager succeeds George A. Zink, who has been named assistant general manager of the Fabricast Division of General Motors at Bedford, Indiana. Mr. Davis was born in Evansville, Indiana, July 7, 1907. He graduated from the University of Notre Dame with a mechanical engineering degree in 1928, and joined the Research Laboratories Division of General Motors in September, 1929. He was transferred to the Cleveland Diesel Engine Division of General Motors in January, 1935, remaining there until November, 1936, when he was transferred to a product study group, engineering staff of General Motors, Detroit, to aid in the development of a new railroad diesel engine

for the Electro-Motive Division of General Motors. Mr. Davis also worked on the development of a smaller diesel engine for general power purposes, and in November, 1937, shortly after Detroit Diesel was founded, Mr. Crowe named Mr. Davis as director of the Detroit Diesel laboratory. From 1941 to 1944 he was assistant to Mr. Crowe, and from 1944 to 1949, general superintendent of production. He was named administrative engineer in 1949. He is married, and has five daughters and one son.

Changes Name



The Board of Directors of Aeroquip Sales & Engineering, Inc., has announced a change in the name of the company to Stratoflex, Inc., and the re-location of general offices, laboratory and factory facilities at 220 Roberts Cut-Off, Fort Worth, Texas. Included in the statement by the Board of Directors was an announcement of new officers for Stratoflex, Inc. K. W. Davis, president; J. E. Everroad, executive vice-president; S. R. Billingsley, vice-president, engineering; W. R. Cook, vice-president, sales; N. E. Barber, secretary-treasurer; H. E. Reese, assistant secretary and J. D. Willis, purchasing agent. All of the new officers had held positions with the old firm prior to the name change. Mr. Davis, in commenting on the action by the board, said, "Though the name may be new to the trade, the type products that we will manufacture, distribute and service are well known through the efforts made by our staff during the past five years. Under the new name of Stratoflex, Inc., will be able to increase our service capacity to our customers and supply them with the finest detachable reusable fittings and flexible hose assemblies available." Stratoflex, Inc., offices, other than the Fort Worth headquarters, are Houston and Odessa, Texas; Birmingham, Ala.; Kansas City, Mo. and Wichita, Kansas.

Leads in Sales

King D. Boyd, sales engineer of Stewart & Stevenson Services, Inc., of Houston, one of the nation's largest distributors of GM Diesel engines, has been named by Detroit Diesel Engine Division of General Motors as the 1957 leader in GM Diesel engine sales in the Division's Central Southwestern sales zone. The zone in which Mr. Boyd competed for leadership with sales engineers of other GM Diesel distributors and dealers includes the states of Oklahoma and Texas. Mr. Boyd, with zone winners throughout the country, was honored March 13 at a banquet in Detroit. He was presented with a ring and a scroll of merit by W. T. Crowe, Detroit Diesel's general manager.



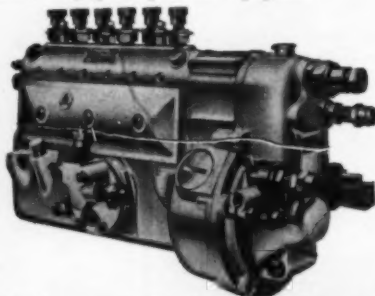
Confidence Abroad



Transport operators all over the world have learnt to trust this sign.

In any language the letters on the C.A.V. sign stand for first-rate service facilities, maintained by highly-trained craftsmen, using special precision equipment.

Wherever vehicles fitted with C.A.V. Fuel Injection Equipment are exported — whether to Trondheim, Santiago, Hong-Kong or Sydney — there's a service agent or depot to give it the specialist attention needed for such high-precision equipment.



Fuel Injection and Electrical Equipment

Service Depots throughout the World

C.A.V. DIVISION OF LUCAS ELECTRICAL SERVICES INC., NEW YORK 19, N. Y.

Sales Office:

14820 DETROIT AVENUE, CLEVELAND 7, OHIO

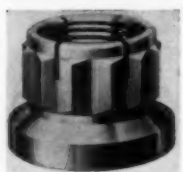
Named Vice-President



E. D. Tull

E. D. (Don) Tull has been named to the newly created position of vice president for personnel and plant, at Cummins Engine Company, Inc., Columbus, Indiana. Mr. Tull's appointment was made known in a joint announcement by Irwin Miller, chairman of the board, and R. E. Huthstener, president of the company. According to the announcement, Mr. Tull will head a new division of the company which will be responsible for all personnel activities and plant construction and maintenance. Until his promotion, Mr. Tull was manager of manufacturing, a position which he had held since April, 1950. His career with Cummins started some twenty-four years ago, in 1928, when he first went to work in the shop. For the next ten years, he worked on various jobs in the factory, becoming foreman of the machine shop in 1938. Two years later, he was named superintendent of the machine shop and, in 1942, became assistant works manager. When he first came to work at Cummins, there were fewer than 70 people in the shop and office combined. A few weeks ago, the corresponding figure was 3,000 for the first time in the history of the company.

High-Strength Nut



Originally designed for aircraft use, an external wrenching nut made by Standard Pressed Steel Co., Jenkintown, Pa., is said to be capable of application wherever space is at a premium and high tensile

strength is a must. This Flexloc nut combines extreme strength with minimum size and weight. The tensiles are consistently in excess of 160,000 pounds per square inch. For example, the 1 1/4-inch size has a minimum tensile of 193,700 pounds, yet weighs only .52 of a pound. Designed with a large bearing surface, it has 12-point serrations to fit standard box or socket wrenches for convenience in restricted space and close clearances. Because it does not have to seat to lock, the Flexloc is a stopnut as well as a locknut, locking securely in any position on a threaded member. Its all-metal, one-piece construction permits its use at temperatures as high as 550 degrees Fahrenheit without loss of locking efficiency. Under latest government specifications for aircraft, the Flexloc external wrenching nut is approved in sizes from 1/4 inch to 1 1/2 inches in the NF thread series. For samples and information, write Standard Pressed Steel Co., Box 816, Jenkintown, Pennsylvania.

Piston Ring Production

Koppers Company, Inc., has announced that, effective last April 1, it is confining its piston ring manufacturing operations to the company's ex-

panding production of aircraft and industrial rings. Announcing this change in operations at the Koppers piston ring plant which until then had also produced automotive rings, Walter F. Perkins, vice president and general manager of Koppers Metal Products Division, said: "Koppers has been a leader in the industrial and aviation ring fields for years. By focusing all our attention on these specialized fields, we will be able to provide even better products and services to the aircraft, industrial, marine, commercial engine, railroad and oil field applications. In these fields we provide both original equipment and replacements. "Under the changed plan of operations, advantages are three-fold." Mr. Perkins continued. "We will have available the services of

a larger number of engineers to work on industrial and aviation rings. We will have more floor space to devote to production. And complete facilities of the fine metallurgical laboratories at the piston ring plant will now be devoted to work in the specialized fields."

Mr. Perkins said that in addition to providing facilities for the expanding industrial ring production, the change in manufacturing operations also will release space needed to expand operations of Koppers' nearby Bartlett Hayward plant, which has accepted additional defense orders. Koppers also has a number of new products under development and is negotiating for rights on others which may be produced.

EASY TO EQUIP MANY BARGES WITH COMPACT MONEY-SAVING OUTBOARD PROPULSION

HARBORMASTER Outboard Units Are Easy To Install On Barges, And Cut Your Towing Costs To A Minimum

THE easiest and quickest way to cut your barge towing costs is to install the Harbormaster Outboard Propulsion And Steering Unit on many special purpose barges such as crane barges, flats, lighters, and dredges.

The Harbormaster Unit is like a "giant portable" . . . easy to install, operate, maintain and service. What's more, the Harbormaster gives you the greatly increased flexibility of operation you need . . . in barges self-powered with outboard power.

You get the ultimate in maneuverability and economy with the Harbormaster Outboard Propulsion And Steering Unit. It allows you to steer instantly with full power in any direction through the M&T 360° patented method of Propellor Thrust Steering Control. You get big savings in fuel because you have more thrust per horsepower.

Important Features that save time and money include exclusive 180° Elevating Mechanism which allows 1-man operator to easily maintain and service the equipment; and Patented Shear Pin, which automatically shears off should underwater assembly strike a submerged obstacle . . . thus opening up vast new shallow water fields to continuous, reliable operation. Harbormaster models, for all marine purposes, are available in sizes from 20 to 300 h.p., gas or diesel power.



Murray & Tregurtha
HARBORMASTER
Outboard Propulsion
And Steering Units

You'll find detailed data and valuable information in our comprehensive catalog containing over 70 photos and diagrams. Gladly sent you on request, whether you have immediate or future use for Harbormaster units. Why not write for the catalog now so that you will have full information on file?

Murray & Tregurtha, Inc.
6 Hancock St., Quincy 71, Mass.

Please send catalog, without obligation, covering the HARBORMASTER Outboard Propulsion And Steering Unit.

Name.....
Company.....
Address.....

Outboard Propulsion . . . Heavy Duty Power With Outboard Maneuverability

Annual Oil & Gas Power Conference

The 24th Annual Conference and Exhibit of the Oil & Gas Power Division, ASME, will be held in the Statler Hotel, Buffalo, N. Y., June 23-27. A program of technical papers and discussions of unusual interest has been prepared and all who are interested in the design, operation and maintenance of diesel, dual fuel and gas engines are invited to attend and participate in this conference. The program is arranged to allow liberal time for inspection of a number of interesting plants in Buffalo and vicinity, including the Worthington Corporation, Niagara hydro plant, Can der Horst and Clark Brothers at Olean, and others. A large number of engine manufacturers, acces-

sories, plant equipment and services will be represented in the exhibit.

Subjects for the technical sessions will include papers on Engine Lubrication, Spark Ignition Gas Engines, Crank Shaft Design Problems and Diesel Engine Power Plants. The latter session embraces three subjects, i.e., Diesel vs. Steam Power Plants, The Place of Diesel Engines in the REA. program, and Vapor Phase Cooling. There will also be a panel discussion on Engines of High Specific Output, subdivided under Design Improvements in High Output Diesel Engines from both the Navy and Industrial Viewpoints; Valves; Pistons, Piston Inserts and Piston Rings; and A Special View of the Piston Sealing Problem. All subjects will be

handled by engineers of high standing in the industry and the entire conference is planned to be helpful to all who are concerned with internal combustion power equipment.

The Hotel Statler, Buffalo, has set aside a large block of rooms for this conference, so plan to attend as many sessions as you can of this important conference, and when requesting reservations, mention the Oil & Gas Power Conference to insure prompt attention.

Promoted



W. N. Eason

H. W. Everroad

Two promotions have been announced by Cummins Sales and Service, Inc., of Ft. Worth, Texas. The announcements, made by J. E. Everroad, president of the organization. W. N. Eason, formerly shop foreman at the Oklahoma City branch was moved up to service manager at the same branch. H. W. Everroad has been moved up from district service manager to manager of the engine division at the same location.

Mr. Eason started with the organization as a mechanic in Wichita Falls, Texas, and spent three years as field service mechanic in that city. In 1950, he was transferred to Oklahoma City as shop foreman and remained in that capacity until his recent promotion. Mr. Everroad came to work for Cummins Sales and Service, Inc., in 1941, as field service mechanic at Wichita Falls, Texas. He subsequently served as mechanic at Odessa, Wichita Falls and Houston, Texas and New Orleans, La. He was promoted to service engineer at Waterproof, La., and then to service manager at Wichita Falls. In 1950, he assumed new duties as district service manager at the Oklahoma City branch.



DIESEL PROGRESS

TODAY'S GIANT

DIESEL VALUE!

D-X DHD MOTOR OIL with EXTRINOL

For big jobs and rugged jobs, Diesel operators choose the giant motor oil value—D-X DHD Motor Oil with Extrinol. It stands up longer under all conditions. It lubricates better. And it's *guaranteed!* Try it in your Diesels.



**Ask for FREE
Engineering Service!**

There is a D-X product for practically every industrial need. If you are located in the Middle West, ask for a D-X Lubricating Engineer's help in solving your problems. His services are free and you are not obligated in any way.

MID-CONTINENT PETROLEUM CORPORATION
TULSA, OKLA.

WATERLOO, IA.

TERRE HAUTE, IND.

OMAHA, NEBR.

CHICAGO, ILL.

MINNEAPOLIS, MINN.

Expansion Voted

General approval to a project costing approximately \$15,000,000 for increased facilities of the Springfield, Ill., Works, Tractor Division, was given by the board of directors of the Allis-Chalmers Manufacturing Company. More than 300,000 square feet of manufacturing floor space, and the necessary machine tools for increased production of crawler tractors, motor graders, and repair parts will be included in the program. The addition will be located east of the main building of plant No. 1 in Springfield. This will be the third expansion of Springfield Works since 1944 when a \$10,000,000 program was put under way and completed after World War II. Another modernization and remodeling project costing \$3,500,000 was completed in 1951. Additional details of this new project will be announced as progress is made in developing plans. Preliminary plans are being drawn and it is expected construction will get under way before the middle of the summer.

Diesels for Flexibility



Replacing a steam locomotive crane with a diesel-powered yard locomotive has resulted in greater flexibility in the operations of the Minnesota Power and Light Company of Duluth, Minnesota. The equipment is used chiefly for spotting coal cars for unloading as needed by the power plant. This is not a constant operation and consequently the equipment has numerous idle periods throughout the day. According to V. A. Miller, the company's chief engineer, the instant availability of diesel power without the necessity of servicing during idle periods greatly simplifies the yard operation. Another advantage cited is a greater margin of safety for yard switchmen due to greater ease of handling and excellent visibility from the cab. Fuel costs under present load conditions average approximately eighty cents per day. The locomotive is a Davenport-Bessler 25 ton model powered by a General Motors six-cylinder diesel engine with torque converter.

The Trend Is to Diesels

Dieselization of the nation's railroad system progressed to such an extent during 1951 that purchases of diesel fuel by the railroads were boosted more than 25 per cent over the previous year, the Eastern Railroad Presidents Conference reported. The Conference pointed out that this half-billion-gallon increase in diesel fuel purchases—the total was nearly 2,500,000,000 gallons, at a cost of \$225,000,000—emphasizes more than anything else the determined effort being made by the railroads to

expand use of this efficient type of locomotive power. In addition, the group noted, it is a mark of the railroads' contribution to conservation of petroleum resources, since the use of diesels entails a much lower overall consumption of oil than does the use of oil-fired steam locomotives.

Dieselization of railroads has proceeded at a greatly accelerated rate since the end of World War II, the Conference said, noting that almost 14,000 new diesel units have been put into service since V-J Day. At the same time, it added, steam locomotives have been retired at a rate of nearly 3,000 a year, with the result that some of the roads have already achieved complete dieselization and others are rapidly approaching that goal. The action of regu-

latory bodies in holding rail revenues far below costs of operation, the report added, is a threat not only to one of the oil industry's best customers, but also to the future modernization plans of the railroads.

Meeting of Highway Officials

The Western Association of State Highway Officials will meet June 5th, 6th and 7th at the Olympic Hotel in Seattle, Wash. The formal program of the meeting will cover many of the problems facing state highway officials in maintaining our increasingly important highway system. The program will include such matters as construction and design, right-of-way and maintenance.

Large Diameter CMH REX-WELD CORRUGATED FLEXIBLE METAL HOSE

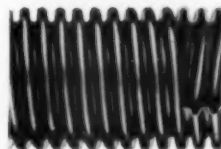


the answer to motion control for:

Diesel Engine Air Intake and Exhaust Lines • Tank Settling Connections • Safety Valve Vent Piping • Compressor Vibration Connections • Heavy Duty Loading and Unloading • And Many Other Services

Wherever large diameter connections must have the flexibility to absorb vibration or expansion and contraction, correct for misalignment or allow movement, and yet provide the rugged durability of metal, CMH REX-WELD Type RW-75 is the answer. REX-WELD Type RW-75 is the flexible connection that requires no packing, no periodical maintenance. All metal construction is completely gas and liquid tight.

For full information and data sheets see your local CMH distributor—look for his name in your classified telephone directory—or write direct.



CMH REX-WELD Type RW-75 is helically corrugated flexible steel hose and is made in sizes from 5" to 24" I.D., inclusive. Furnished with standard pipe nipples, couplings, fixed or floating flanges. Flanges to customer design can also be attached. Where required RW-75 can be supplied with metal braid covering.



Flexon identifies CMH products that have served industry for over 50 years.

CHICAGO METAL HOSE Division

Flexonics Corporation

1325 S. Third Avenue • Maywood, Illinois

Manufacturers of Corrugated and Corrugated Flexible Metal Hose in a Variety of Metals • Expansion Joints for Piping Systems • Seamless Steel and Brass Bellows • Flexible Metal Conduit and Armor • Assemblies of These Components
In Canada: Canadian Metal Hose Co., Ltd., Brampton, Ontario

Manager of Irrigation Division

W. B. Collett has been appointed manager of the newly expanded irrigation division of Stewart & Stevenson Services, Joe Manning, Stewart & Stevenson general manager, has announced. Mr. Collett will make his headquarters in San Juan, Texas. The irrigation division serves all of Texas. The new division has been expanded to provide better service for customers throughout the state.

Diesels Pay Off

The Saginaw Transfer Company of Saginaw, Mich., increased its hauling business 63 per cent while keeping its total truck fuel costs approxi-

mately the same, as a result of changing over to diesel highway tractors, a case history of the company's operation discloses. In June of 1949, before Saginaw Transfer operated diesel equipment, its gross business was \$152,000 for the month of June, of which \$9,534 went for gasoline. Two years later when its over-the-road operation was 100 per cent GMC diesel, Saginaw Transfer in the month of June grossed \$239,000 while spending \$9,747 for fuel. Saginaw Transfer, which hauls general merchandise throughout the lower part of Michigan, going as far west as Chicago, employs 18 mechanics to service its entire fleet of 175 trucks of which 72 are GMC diesels for the over-the-road work. Of the 18 mechanics, 10 are employed in Saginaw and the others are in the Chicago terminal.

The GMC diesels include twelve 750 models and 60 HDCR-640 and 650 models. They travel 6,300,000 miles annually and require about 50 per cent less maintenance than the gasoline models previously used. The territory which Saginaw Transfer operates over is, for general purposes, a short haul operation with no mountainous area. "For profitable truck transportation I have proved that our GMC diesel truck power is also well suited for short hauls, over level country, without heavy loads," said Mr. Bill Brown, president of the company.

Introduces New Inspection Method

Turco Products Inc. of Los Angeles, California, has introduced a new high volume dye penetrant inspection method similar to that introduced as Dy/Chek. It is known as Chek-Spek. It consists of only two materials, a penetrant and a developer. These solutions, both non-toxic and non-inflammable, can be applied by any of three methods, spray, dip or brush. Pre-cleaning and dye removal are accomplished by suspending the parts being inspected in the vapor zone of a vapor degreaser. Chek-Spek is royalty-free and license-free and is applicable to both ferrous and non-ferrous metals.

Rip-Rap for Grand Coulee

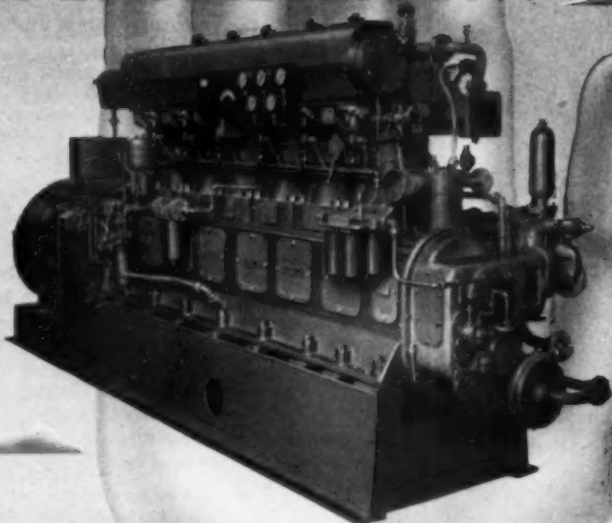


A new 2½ yard Link Belt shovel, powered by a 275 hp. Model NHS-600 Cummins diesel torque converter unit, loads a 36TD Euclid dump truck at the site of Grand Coulee Dam in the State of Washington, with rock. Both units are owned and operated by Pacific Bridge Company, San Francisco, which has the contract for "rip-rap" work on the face of Grand Coulee Dam. Pacific Bridge operates seven of the 18-ton capacity Model 36TD Euclids on this project, all of which are powered with 300 hp. Model NHRBS-600 Cummins diesels driving through torque converters.

Enters Diesel Service Tool Field

Bacharach Industrial Instrument Company has entered the diesel service tool field through the purchase of all inventories and production facilities of Curtiss & Smith Mfg. Co. of Pottstown, Pa. This new activity will greatly expand Bacharach's service to the diesel industry to which the company has supplied specialized service instruments for twenty-five years. Initially Bacharach will make all service tools previously manufactured by Curtiss & Smith, which comprise tools and equipment for servicing the complete line of Cummins diesels and GM Detroit diesels, as well as service tools for GM truck and coach overhaul. The company's immediate aim is to build up an inventory of frequently-purchased tools to a level adequate to satisfy customers' delivery requirements. Administrative and sales offices of Bacharach are at 7301 Penn Ave., Pittsburgh, Pa.

Since 1885 UNSURPASSED DEPENDABILITY...



Today's modern UNION Diesel products* incorporate and pioneer improvements which assure unsurpassed dependability for your —

**Greater Safety • Lower Operating Costs
Long Term Satisfaction • Increased Profits**

*DIESEL ENGINES
DUAL-FUEL ENGINES
GENERATOR SETS
HEAT EXCHANGERS
ALARM SYSTEMS
CUSTOM MACHINERY

UNION DIESEL

2121 DIESEL STREET • OAKLAND 6, CALIFORNIA, U.S.A.

Personnel Shifts



J. A. Justeson



Frank McNamara

J. A. Justeson, for the past seven years assistant western sales division manager for Caterpillar Tractor Co. at San Leandro, California, has been named eastern sales manager with headquarters at Peoria, Illinois. He is succeeded at San Leandro by Frank McNamara, who has been the company's district representative with headquarters at Sacramento, California. Mr. Justeson succeeds W. S. Ziegler who takes over the duties of assistant director of sales for Caterpillar during the absence of J. W. Mohler, who leaves the company for one year to serve the National Production Authority as deputy director of the construction machinery division. Mr. Justeson joined Caterpillar as an agricultural representative in 1935 and is well known throughout the western states, British Columbia, and Alaska. Mr. McNamara became associated with the company's sales department after three years of active naval duty during World War II, and before being assigned to the western division was district representative on the Atlantic Coast.



W. S. Ziegler



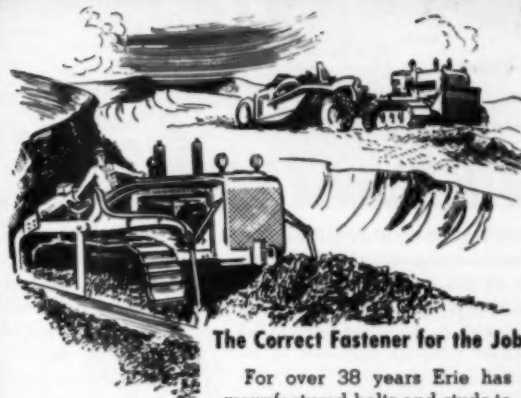
J. W. Mohler

Mr. Ziegler has been eastern sales manager since 1944, having started as a district representative in 1929. Mr. Mohler, whose first job with the company was in the factory in 1934, was on leave to the War Production Board during World War II. He became director of the production division and assistant to the vice chairman, returning to Caterpillar in 1944 after serving the WPB for three years.

Mexican Representatives

The Swartwout Company has announced the appointment of the firm Mercator de Mexico, S.A., to act as Swartwout sales and engineering representatives for Mexico. The new representative sells and services the complete line of Swartwout power plant equipment, feed water heaters, desuperheaters, separators, pressure and regulating valves, and pneumatic controls as well as the new all-electronic Autronic Process Controls and Control Systems. Established at Av. Insurgentes, 193 Mexico 7, D.F., Mexico, Mercator de Mexico acts as distributor for power plant, combustion and process control equipment.

For DEPENDABILITY IN CONSTRUCTION EQUIPMENT



The Correct Fastener for the Job

For over 38 years Erie has manufactured bolts and studs to the specifications of Diesel Engine builders. This specialized experience gained in working with leading Diesel designing engineers assures you of getting the exact materials and the precise tolerance in bolting desired for your Diesel. Send us your specifications for Diesel Connecting Rod Bolts, Cylinder Head Studs, and other special bolting.



ERIE BOLT and NUT CO.
ERIE • PENNSYLVANIA

STUDS • BOLTS • NUTS
ALLOYS • STAINLESS
CARBON • BRONZE

Representatives in Principal Cities.

THIRD ANNUAL MEETING



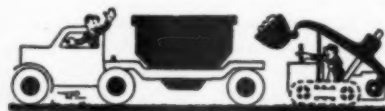
The third annual meeting of the advertising managers, sales promotion managers and public relations directors of the members of the Diesel Engine Manufacturers Association took place Thursday, March 13th, at the Union League Club of Chicago. About thirty-five executives of the various companies comprising DEMA were represented, and discussions pertained to the problems of the respective fields in which these executives operate.

In the photograph, standing, left to right: R. P. March, Worthington Pump and Machinery Corp.; J. D. Grace, Nordberg Manufacturing Co.; E. J. Parish, Ingersoll-Rand Co.; Wilbur W. Young, DIESEL PROGRESS magazine; Robert B. Craig, Diesel Engine Mfrs. Ass'n; L. H. Geyer, Ingersoll-Rand Co.; W. W. Fox, Detroit Diesel Engine Div., General Motors Corp.; E. L. Satola, Nordberg Manufacturing Co.; Don House, Nordberg Manufacturing Co.; H. J. Barbour, Fairbanks, Morse &

Co.; Volney B. Fowler, Electro-Motive Div., General Motors Corp.; Rex W. Wadman, DIESEL PROGRESS magazine; E. W. Manterfield, American Locomotive Co.; Frank A. Uniack, Cleveland Diesel Engine Div., General Motors Corp.; Harvey T. Hill, Diesel Engine Mfrs. Ass'n.

Seated, first section, left to right: C. E. Dietle, Fairbanks, Morse & Co.; J. A. Jones, International Harvester Co.; James Love, International Harvester Co.; J. R. Roberts, International Harvester Co.; R. S. Ogg, Baldwin-Lima-Hamilton Corp.; H. H. Cohenour, Buda Company; Bobette Boysen, Diesel Engine Mfrs. Ass'n.

Second section, left to right: W. P. Durbin, Electro-Motive Div., General Motors Corp.; George B. Cushing, The National Supply Co.; G. R. Brighton, Jr., Diesel Power magazine; Brian P. Emerson, Diesel Power magazine; E. R. Bonnist, The Cooper-Bessemer Corp.; Charles N. Graff, Clark Bros. Co., Inc.; Allen Colby, The National Supply Co.; Roger D. Williams, Cleveland Diesel Div., General Motors Corp.; Robert L. Stanley, Diesel Engine Manufacturers Association.



another **important***
diesel installation

gets
HONAN-CRANE
Oil Purification

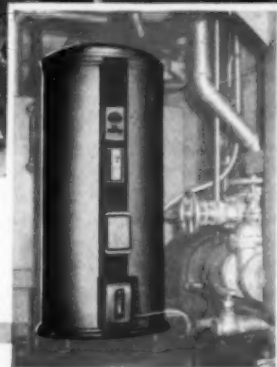
In the three diesel installations at The International Latex Corporation, Dover, Delaware, every detail has been planned for maximum efficiency and economy of operation. That's Why Honan-Crane Lube Oil Purifiers again are first choice for dependable protection against breakdown and excessive wear caused by contaminated oil.

Honan-Crane Oil Purification (for either inhibited or straight mineral oils) protects bearings, cylinder walls and other finely machined parts from improper lubrication and costly damage often caused by solid abrasive contaminants . . . or by acids, gums, resins and other products of oxidation.

Write today for complete information about Honan-Crane Diesel Fuel and Lube Oil Purifiers.



* **40% recovery** of traditionally wasted engine heat is the amazing accomplishment of newest diesel installation at International Latex Corp. Shown above is the 1700 hp. Cooper-Bessemer protected by Honan-Crane continuous lube oil purifier at right. Two other Cooper-Bessemers are also served by Honan-Crane purifiers.



© 1952 HONAN-CRANE CORP.

HONAN-CRANE CORP., 202 Indianapolis Ave., Lebanon, Indiana
A Subsidiary of **HOUDAILLE-HERSHEY CORPORATION**

Pedrick Sales Manager



Ralph W. Doherty

Announcement has been made by W. E. Wilkening, vice-president in charge of sales for Wilkening Manufacturing Co., Philadelphia, maker of Pedrick piston rings, of the promotion of Ralph W. Doherty to the post of sales manager of the company's replacement division. Mr. Doherty has been divisional sales manager of the west north central states with headquarters in Kansas City. He is a graduate of the University of Arizona, worked for 5 years with Stuckey Auto Supply of Phoenix, Ariz., for 12 years with Aluminum Industries of Cincinnati as western sales manager, then eastern sales manager, and, before joining Pedrick, was manager of the automotive division of Service Supply Corp. of Philadelphia. In his new capacity, Mr. Doherty will headquarter at Pedrick's main office in Philadelphia.

Army Orders Diesel Locomotives

Eighty-three Alco-GE lightweight locomotives, capable of operating on nearly any wide gage track in any climate in the world, have been ordered from General Electric by the Army's Transportation Corps Depot at Marietta, Pa. Delivery of the \$14,296,790 order is scheduled for 12 months, depending upon materials allocations, G-E officials said today. The contract for the versatile 120-ton units is the Transportation Corps' largest locomotive order since World War II. The locomotives will be built by the American Locomotive Company at Schenectady and will be supplied with G-E electrical equipment manufactured in General Electric's Erie, Pa., Works. They will be powered by standard Alco 12-cylinder 1600-hp. diesel engine.

Main design features of the 1600-hp. road switchers include low weight per axle for operation on light rails and small bridges in foreign countries. Weighing 15 to 40 tons less than similar styles of American 1600-hp. locomotives, the Army units will have six motor-driven axles, two more than most locomotives of this rating. The units are designed to operate in weather ranging from 40 below zero to 125 degrees above zero. They will be equipped with auxiliary heaters to permit starting at low temperatures, and 50 will have steam generators for passenger train heating. Adjustable trucks and brake rigging will enable the locomotives to operate on the standard American gage of 56½ inches and foreign gages of 63 and 66 inches.

Personnel Reassignments

Mr. M. W. Smith, president of Baldwin-Lima-Hamilton Corporation, today announced that Mr. J. R. Weaver, vice-president, Defense and Special Products Division, Eddystone, has resigned to accept a position on the staff of the recently appointed vice-president in charge of manufacturing at Westinghouse Electric Corporation. Mr. Smith stated that the Foundry, Defense and other

Special Products previously under Mr. Weaver's supervision will be combined with the Southwark Shop into one group to be known as Southwark and Special Product Division, which will be under the direction of Mr. R. B. Crean, vice-president.

Mr. Smith also announced that Mr. Walter A. Rentschler has been appointed vice-president in charge of the Eddystone Division. Mr. Rentschler, who has previously been vice-president in charge of the Lima-Hamilton Division of the Corporation will continue in charge of the Hamilton plant, which will come under the immediate supervision of Mr. J. F. Connaughton who has been appointed general manager of that plant. Mr. Smith pointed

out that this arrangement will serve as a means of promoting closer coordination between similar activities and overall operations of these two plants.

The Lima Division will continued under the direction of Mr. H. F. Barnhart who will report to the President. Mr. Alex Smith has been appointed manager of a newly created Export Sales Department which is being established on a company-wide basis to serve and co-ordinate the foreign sales activities of all divisions. Mr. C. A. Campbell, formerly head of export sales for the Eddystone Division, will become assistant manager of the new Export Sales Department. The headquarters of this department will be located in New York City.

check
diesel
performance

Instantly!

If you want the best from your diesels—minimum fuel consumption per horsepower and long service uninterrupted by breakdowns—watch your exhaust temperatures!

That's the way to get advance warning against trouble from preignition, detonation, overloading, or breakdown of lubrication, etc.

Alnor Exhaust Pyrometers give you this protection with constant, instant checking of individual cylinder exhaust gas temperatures. Modern design and rugged construction assure accurate, reliable service on any installation—stationary, portable or marine—under the severest operating conditions.

Low in cost, easy to install on new engines or old, Alnor Exhaust Pyrometers can bring you increased operating efficiency and economy . . . reduced engine maintenance expense. Ask your Alnor Representative to assist you in selecting the right pyrometer and thermocouples for your installation.



Type RT switchboard type multipoint pyrometer for either surface or flush mounting . . . conduit wiring at back or bottom of case. Equipped with automatic cold end compensator. Switch capacities for 8, 17 or 31 circuits.



Type BZ, a rugged, accurate multipoint pyrometer in water-tight, dust-tight and fume-proof case. Can be mounted on switchboard, wall, bracket, or directly on engine. Switch capacity of 8 or 17 circuits.

Type FAX, compact in size, moderate in cost. Rugged construction withstands vibration even when directly mounted on engine. Splash-proof, dust-proof switchboard or flush mounting, with switch capacity from 2 to 16 circuits.



Send for your Alnor Exhaust Pyrometer Bulletin today!

Alnor

PRECISION INSTRUMENTS
FOR EVERY INDUSTRY

ILLINOIS TESTING LABORATORIES, INC.
Room 508, 420 N. LaSalle Street
Chicago 10, Illinois

Gentlemen: ☐ Please send me a copy of Bulletin 4257
☐ Please have an Alnor representative call

Name.....

Company Name.....

Address.....

City..... Zone..... State.....

Euclid Estimating Book

The Euclid Road Machinery Co., Cleveland 17, Ohio has just published a revised and enlarged edition of an estimating book that has been widely used by engineers and estimators. Entitled "Estimating Production and Costs of Material Movement with Euclids," the book is attractively printed in two colors and contains many useful charts, illustrations, formulas and reference tables.

Although the book is intended for use in making production and cost estimates for Euclid earth moving equipment, the estimating methods and formulas can also be applied to equipment of other makes. Part #1 covers job analysis and the method

of estimating production and the number of hauling units required for a specific job. The next section deals with cost estimating which includes the hourly cost of ownership and the cost of operation and maintenance. Samples of two very useful work sheets that are also available from Euclid are shown in this section. Part #3 contains formulas to determine grade ability, rim pull, engine torque etc., and several pages of tables with commonly used dimensions, weights and other data.

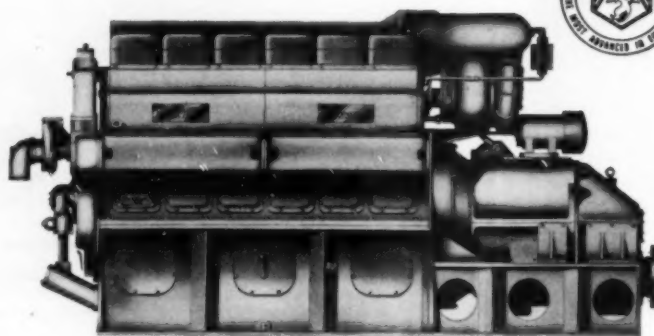
The Euclid estimating book is available to owners of earth moving equipment, engineers and others engaged in estimating work. Copies may be obtained from the company or from local Euclid distributors.

STERLING offers you all three!

- ✓ **LOW INITIAL COST**
- ✓ **LOW OPERATING COST**
- ✓ **LONG LIFE**

For fifty years the Sterling Engine Company has been producing high quality light and heavy duty equipment for an ever widening variety of industrial applications.

No matter how diverse the applications, however, Sterling engines have always been characterized by the "Big Three" value that has spelled efficiency and economy to engineers and industrial users for generations.



Sterling Viking Diesel 6 cylinder marine engine with reverse gear rated at 665 HP in continuous service.

STERLING ENGINE COMPANY

1270 Niagara St. • Telephone LI 0382 • Buffalo 13, N. Y.

Mobile Schools to Continue

To meet the growing demand for trained diesel mechanics, the GMC Truck & Coach Division is continuing its mobile diesel service training schools indefinitely, it was announced by A. A. Shantz, general parts and service manager for the division. Since the four GMC mobile diesel truck service training schools started their activity in November 1950 they have trained more than 2,000 diesel mechanics for GMC truck operators and approximately 900 GMC dealers throughout the nation, Shantz reported. "The demand for this type of training, however, is noticeably greater this year," he said. "This is undoubtedly due to the fact that the trend in the trucking industry today is predominantly toward diesel power."

The mobile schools, mounted on GMC diesel trucks, have appeared in nearly every city where there has been a need for diesel mechanics and now have started to re-visit many points where additional mechanics are in demand. The schools give experienced mechanics a five-day course, which includes work on live GMC diesel engines and sub-assemblies while teaching operation, maintenance and overhaul. Each school is limited to 12 students, who are under the supervision of factory-trained instructors. Shantz said the course had been slightly altered to include the new GM 3-71 diesel, the three-cylinder engine recently introduced in the two and one-half ton GMC Model D450-37.

Volt Ammeter



The all new Columbia Type AC-1 volt-ammeter is a clamp-type, hand-sized measuring instrument that does two separate jobs—measures volts and amperes—instantly and accurately. This new instrument has just been announced by Columbia Electric Mfg. Co. to supplement its long-established line of Tong Test Ammeters. Readings are made without breaking circuit or insulation. To read amperes the convenient trigger is pressed, opening the pair of insulated jaws so that they can be easily encircled around the power cable or bus bar. The jaws will accommodate cables up to 1½ inches in diameter and bus bars up to 2 in. x ½ in. Four amperage ranges are available: 0-12, 0-60, 0-120, 0-600 ac. amperes. Voltage leads are quickly and safely plugged into the handle of the instrument. Two voltage ranges are available, 0-150, and 0-600 ac. volts.

Small enough to insert in a pocket, the instrument is easily held and operated with one hand. It weighs less than two pounds. Overall dimensions are 11 in. x 3½ in. x 1½ in. The trigger and housing of the instrument are ruggedly constructed of a durable molded phenolic material. Accuracy is plus or minus 3% of full scale deflection. Complete unit includes voltage leads and carrying case. For further details, a descriptive circular is available on request by writing Columbia Electric Mfg. Co., 4553 Hamilton Avenue, Cleveland 14, Ohio.

DIESEL PROGRESS

Western Sales Manager for Shell



George W. Huldram, Jr., has been appointed to the new position of sales manager of the Western division of Shell Chemical Corporation, it was announced recently. In making the announcement, G. R. Monkhouse, Shell Chemical vice president in San Francisco, said that the creation of this position was another step in the strengthening of Shell Chemical sales and customer service to meet the expanding growth of agriculture and industry in the West. Huldram began his career as a chemist at Shell Chemical's Pittsburg, California, plant in 1939, after completion of studies at the University of California.

Guide to Pump Applications

A new type of reference chart on small pump applications has been developed by Tuthill Pump Company, Chicago. In one convenient table, this guide lists the various type of Tuthill pumps, the services for which each is built, the performance characteristics, types of packing, styles of mounting, and features that distinguish each model. Copies of this helpful reference table are available on request to Tuthill Pump Company, 939 East 95th Street, Chicago 19, Illinois.

Towboat Ordered

St. Louis Shipbuilding and Steel Co. of St. Louis, Missouri has received an order from the Rose Barge Line of Marseilles, Illinois for a 400 hp. single screw towboat, to be powered by a Caterpillar D-397 diesel engine. The hull of the craft will be 68-ft. x 19-ft. x 8-ft. and will be equipped with a Kort nozzle and a contraguide rudder. The boat will also have a raising and lowering pilot house for use on the upper Illinois river.

Expands RR Diesel Facilities

Designating Cleveland as the site of its major diesel shops, the New York Central Railroad will expend \$5,000,000 in changing over its steam locomotive shops into its largest and most modern diesel repair installation. With the greatly increased dieselization of the road, Cleveland was selected because of its central location to house the new shops. All major overhauls will be made in Cleveland. The new facilities, it is expected, will be placed into service some time next year.

Heads Industrial Sales

The appointment of William H. Steinkamp as sales manager of the industrial division of Minneapolis-Honeywell Regulator Company was announced recently. Mr. Steinkamp has been industrial field sales manager since 1943. He succeeds L. Morton Morley, who continues as vice president of the Brown Instruments division and who will

assume greater responsibilities concerning division policies and other company matters arising from the accelerated demand for industrial instrumentation. A graduate of New York University in 1928, Steinkamp joined the Brown division in 1930 as field sales manager, and has represented the Brown division in New York, Buffalo, Cleveland and Pittsburgh, where he served as branch manager.

Issues 24-Page Booklet

Men responsible for the application of power to industrial machinery will be interested in the "Basic Industries Issue" of "Production Road," house organ of the Twin Disc Clutch Company, just off the press. The 24-page booklet presents a

colorful picture of the basic industries—agriculture and forestry; mining, including fuels, metals, and aggregates; construction; transportation; fishing; and manufacturing and processing. It points up the opportunities and responsibilities involved in building products which are closely interlocked with, and aid, modern man's drive for better living.

A wide variety of usages to which industrial friction and hydraulic drives are being applied—from farm tractors to fishing trawlers; from mining shovels to machine tools—are described through readable articles and graphic, one-the-job illustrations. "Production Road" is regularly issued, and will be mailed upon request to the Twin Disc Clutch Company, Racine, Wisconsin.

NOW... the NEW

NON - CHANNELING REPACK FILTER






ASSURES:

- Cleanest Oil
- Lowest Cost
- Easiest Servicing

In over two years of extensive field use O-P Repack Filters have saved up to 75 percent in filter maintenance.

For the first time, no investment in expensive disposable cartridges is necessary to assure uniform results.

Field and laboratory tests prove that O-P Repacks absorb solids without premature plugging . . . give uniform filtration without voids or channeling.

The split cage with convenient clasps provides quick and easy disposal of contaminated filter material. Re-packed in a matter of minutes. Parts machined to provide perfect seal. Only one gasket, no bolts or springs.

O-P Repack units are available to meet all your requirements. Ask us about Repack cartridges to fit present filters. Let us engineer your next filter installation.



SOME OF THE FIRMS USING O-P REPACK FILTERS:

Oliver Iron Mining Division of U. S. Steel, Duluth, Minn.
 Pickands Mather & Co. (Iron Mining Operations), Duluth, Minn.
 Moland Brothers Trucking Co., Duluth, Minn.
 Border Counties Power Cooperative Inc., Warroad, Minn.
 Minnesota & Ontario Paper Co., International Falls, Minn.
 General Minnesota Utilities Co., Pine City, Minn.
 City of Thief River Falls, (Power Plant) Thief River Falls, Minn.

DULUTH FILTER CO.
 2911 W. SUPERIOR ST. DULUTH 6, MINN.

COPYRIGHT 1952

O-P REPACK FILTER...
 Cut your Filtration costs in half!



WRITE FOR FOLDER AND QUOTATIONS

Diesels Add Up to Economy

According to a report by the Louisville and Nashville Railroad, its dieselization program has helped the road show the second highest net income in its history despite increased costs. The report added that the program has resulted in "relative savings" of more than 30 million dollars in the two years.

To Be Exhibited

The Brush Engineering Co. Ltd. will have several exhibits showing at the British Industries Fair in Birmingham, England. They will include an electrical generating plant, transformers,

switchgear, electrical rotating machinery and diesel-electric locomotives. The latter will be represented by models and will consist of Brush-Bagnall shunting and main line locomotives. All these locomotives are powered by Mirrless J-Type engines with Brush electrical equipment and can be supplied suitable for any gauge. The range of sizes which can be supplied is from 400 hp. to 2,000 hp.

Heads Michiana Chicago Office

Michiana Products Corporation of Michigan City, Indiana, makers of alloy casting and high temperature fans, have appointed Mr. Harry A. Porter, Jr., to assume charge of their Chicago office

at 80 E. Jackson Blvd. Mr. Porter, who succeeds Mr. J. H. Staiger as head of the office is a graduate metallurgical engineer (Carnegie Tech, 1941) and has previously been engaged with National Malleable and Steel Castings Company as a metallurgical engineer in promotional work.

The Old and The New



The camel is fighting a losing battle in the transportation revolution sweeping oil-rich Saudi Arabia. Its latest competition is the modern diesel-electric locomotive. Arab youths, many of whom had been brought up as desert camel herders, are today training as locomotive engineers, train dispatchers, station agents and diesel mechanics to operate the new, 350-mile Saudi Government Railroad. As part of this extensive training program, a hand-picked group of 12 Arabian youths recently completed an intense two-week course in operation and maintenance at the Alco-GE Diesel-Electric Locomotive School at American Locomotive Company's plant in Schenectady, N. Y. Thousands of U. S. and foreign railroad men have attended this school, which was established in 1946 to acquaint railroaders with the construction, operation and maintenance problems of the diesel-electric locomotive.

The Arabs' 50-day tour of the U. S. railroad and locomotive manufacturing facilities included visits to Detroit, New Haven, New York City, Philadelphia and Washington, D. C. Under construction for four years, the main line of the Saudi Government Railroad was formally placed in operation by King Ibn Saud in October, 1951. The road, which carries passengers, food supplies and building materials as well as oil field equipment from the Persian Gulf to the capital at Riyadh, was built by the Arabian American Oil Company. However, the \$50 million cost is being financed by the Saudi Government out of oil royalties.

Eaton Parts for Diesel Engines



have a background of years of cooperation with the Diesel industry

Eaton is proud to have served as supplier to leading Diesel engine manufacturers for many years—furnishing valves, free-valves, lash adjusters, valve seat inserts, cam followers, bolts, studs, and other precision

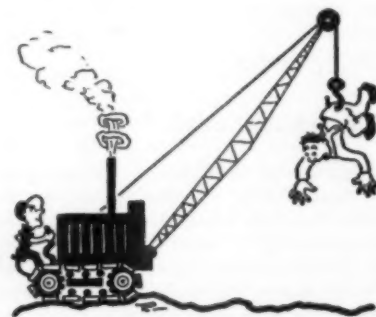
parts. This close cooperation with the Diesel industry has given Eaton engineers a thorough understanding of the requirements of specific engines, so essential in solving valve-train and other problems.

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

SAGINAW DIVISION: 9771 FRENCH ROAD • DETROIT 13, MICHIGAN

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers



DIESEL PROGRESS

Florida Diesel News

By ED DENNIS

AN INTERNATIONAL diesel with an Electric Machinery 50 kw. 173 volt generator for the Miami Battle Creek Sanatorium, sold by the Dixie Machinery Co. of Miami. Belcher No. 2 fuel oil is used.

TWO MODEL HRB 600 Cummins 165 hp. to repower 2 Euclid dump trucks for the Miami Crush Stone Co. Sold by Cummins Diesel of Florida.

THE *RIO MAR* of Haiti a 148x24 cargo vessel repowered with a model MRDB 8 Superior 152 hp. at 1200 rpm. Ross Heat Exchanger, Snow Nabstedt 3:1 reduction gears, and a Fairbanks, Morse light plant. Owned by Cominones-y-Maraitomous Industry. Engineered and sold by Auto Marine Engineers of Miami.

DEWAL FARMS near Homestead received another TE 24 International dozer which makes a total of 4 all delivered by Florida Georgia Tractor Co.

TOUGH and built to take it, are the two Fairbanks-Morse diesels at the new power plant of Winn and Lovett Grocery Co., Hialeah. Model 32 E14 4-cyl. 300-hp. at 300 rpm. Asco lubricators, Woodward I-C governors. Fairbanks, Morse 141-159 kw. generators, 695 amps., Ross heat exchangers with Fulton Sylphon regulators, Bode oil coolers, Burgess Manning intake breathers and exhaust snubbers. Westinghouse control panel and Asco auto safety control for temperatures and oil pressures. For starting air, a Fairbanks, Morse air compressor with a 3-hp. Model Z Fairbanks, Morse gasoline horizontal engine is used. The power plant also contains 4 Frick 9x9 ammonia refrigerator compressors, Type H, with Madison-Kipp lubricators. Gulf No. 1 fuel oil and Lion lub-oil is used. A beautiful installation.

CORRECTION: On yacht *Caprice*; as we were misinformed we wish to apologize and give credit to the Auto Marine Engineers of Miami who handled the transaction on the diesel engines, and Miami Shipbuilding Corp. who installed them. A fine ship and an excellent engineering job.

HEADING SOUTH was the *Spot Pack*, a 109x21 heavy duty combination shrimp trawler and freezer. A 400-hp. Cooper-Bessemer and 2 Hercules 25-kw. generators in the engine room, 1-cyl. GM 71 for the deck winch, 4 Bruning refrigerator compressors for a 40 deg. below freezer which holds 36,000 lbs. of frozen shrimp. Capt. M. J. Miller on the bridge; Mr. E. Sooder, Miami, owner.

MIAMI Marine Engineers reports a pair of Kermaths; Model 4-226 for Pedro DuQueuse of Havana Yacht Club. Snow Nabstedt clutch and Greyhound 2:1 reduction gears. Delco-Remy 12-volt starters and generators, has a Synchro Master to automatically keep the engines synchronized while cruising at 12 knots in Cuban waters.

2 NEW 14-yd. LeTourneau Tournapulls powered with GM 6-71 diesels for use on drainage canal projects to make a total of 6 units for the H. L. Mills Construction Co., Miami.

FLORIDA shrimp boats were on their way home after being held for 4 days in a Mexican port on suspicion of fishing too close to the Mexican coast. A possible international incident was averted as Mexico released 4 American shrimp trawlers which had been seized by Mexican gunboats. Their release was reported after U. S. Ambassador William O'Dwyer conferred with Mexican officials. The highlight of the event was brought about by young 19 year old Capt. John Donald Bothwell of the *Miss Suzanne* who decided to make a run for the

open sea after being stopped by the Mexican gunboats, he not only outsmarted them but also outran them and was the first to report the news.

State Representative John M. Hathaway of Punta Gorda, who first spread the alarm that shrimpers were arming their ships to protect themselves at sea, declared with a grin, when he heard of the release, "Everybody seems to be happy now that the war is over." The U. S. Coast Guard assured Tampa shrimpers that they would patrol the area where the trawlers had been seized. The *Miss Suzanne*, a 60x18 shrimp trawler built by Diesel Engine Sales of St. Augustine; powered with a Caterpillar D13000 Snow Nabstedt 3:1 reduction gears and a 48x44 four blade Columbia propeller.

Low Maintenance Costs

start here...



in the **LANOVA** combustion system!

When combustion takes place in a Diesel cylinder, pressures shoot up instantaneously to tremendous heights. In ordinary Diesels, the pistons, bearings, rings and wrist pins have to bear the brunt of these life-shortening jarring pressure blows.

In Diesels that use the Lanova Combustion System, however, these important working parts are protected. Combustion pressures are isolated in the Lanova energy cell and fed back into the cylinder in the form of smooth, powerful working pressures that are applied to the piston over a full degree of the power stroke. The result is longer life to working parts, less wear and fewer maintenance problems.

MOST LEADING MAKES of Diesels use the Lanova Combustion chamber principle. But be sure of getting what you want — always look for the distinctive Lanova energy cell design.



LANOVA CORPORATION
38-17 30th Street
Long Island City 1, N. Y.

ONE OF AMERICA'S FOREMOST NAMES IN
DIESEL RESEARCH AND DEVELOPMENT

CHECK and COMPARE THESE FEATURES

- Starting motor can be mounted more easily and in more positions.
- Requires no actuating linkage—solenoid can be placed in any convenient position.
- Simple in design—has fewer parts—needs fewer adjustments.

It takes a truly outstanding product to receive over 85,000,000 endorsements. Yet, that's the number of Bendix Drives that have been installed. No other starter drive approaches this record of outstanding performance. That is why, whatever your type of diesel or whatever its purpose, it will pay you to specify Bendix* Starter Drive for the most economical installation and dependable performance.

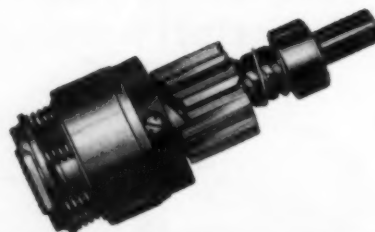
*REG. U.S. PAT. OFF.

ECLIPSE MACHINE DIVISION of
ELMIRA, NEW YORK



Export Sales: Bendix International Division, 72 Fifth Ave., New York 11, N.Y.

Here's Why PERFORMANCE IS BETTER WITH *Bendix* STARTER DRIVES



DIESELS for operating ECONOMY

The present day trend toward diesels — both for new installations and for replacements — is largely due to operating economy and dependability.

Current installation practice is to mount them on Korfund Vibro-Isolators.

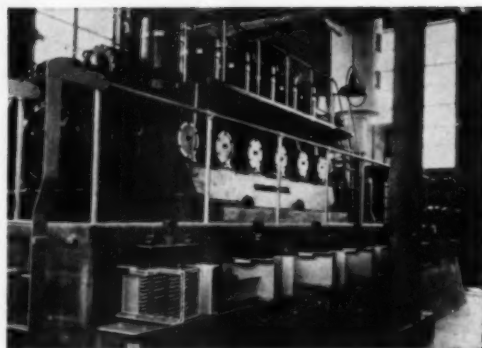
This makes it possible to install diesels anywhere with positive assurance that there will be absolutely no transmission of objectionable vibration. Additional benefits include savings from reduction of building and engine maintenance costs, and frequently the elimination of concrete foundations.

Vibration is absorbed by steel springs which provide the finest isolating medium available. Thrusts are controlled by resilient chocks in the four corners.

The result is smoothed, floating operation at all speeds — in marine, mobile, or stationary installations. The cost is low. Ask for Bulletin G-104. Representatives in principal cities.

The Korfund Company, Inc.

48-20B 32nd Place, Long Island City 1, N. Y.



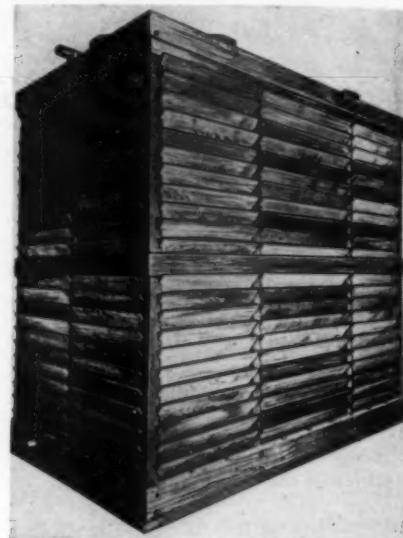
Fairbanks-Morse 450-hp. Unit at Floyd Bennett Field, Brooklyn, N. Y. Foundation located above ground because of high water table. Four Korfund isolated Nordberg 1425-hp. units were recently installed by Bangor Hydro-Electric Co., in Maine.

A Few Typical Installations:

| | |
|--|---|
| Bangor Hydro-Electric Co., Bangor, Me. | 6 1425-hp. Nordberg |
| Lenox Hill Hospital, New York | 1 750-hp. Worthington |
| 2 Park Avenue, New York | 4 450-hp.; 1 750-hp. Worthington |
| New Yorker Hotel, New York | 1 530-hp.; 1 750-hp. Bosch-Sulzer |
| Wann Department Store, Brooklyn | 4 200-hp.; 1 180-hp.; 1 150-hp. Worthington |
| Mercy's, New York | 1 700-hp. Alco |
| Floyd Bennett Field, New York | 1 450-hp. Fairbanks-Morse |
| Prudential Insurance Co., Newark, N. J. | 1 740-hp. Baldwin |
| Long Star Gas Co., Dallas, Texas | 1 400-hp. Cooper-Bessmer (Gas) |
| Sea Oil Co., Marcus Hook, Pa. | 4 250-hp. Ingersoll-Rand (Gas) |
| Cia Central Argentina De Electricidad, Buenos Aires, S. A. | 1 270-hp. Sulzer; 2 540-hp.; 1 540-hp.; 1 700-hp. Beute |

KORFUND for operating SMOOTHNESS

Packaged Cooling Towers



A line of "master engineered" cooling towers known as "Cotospray" towers of the finest clear all heart redwood, ideally suited for jacket water cooling, is being marketed by J. F. Pritchard & Co. All bolts, nuts, washers and nails in the unit are galvanized steel. The distribution header is of steel and the nozzles are bronze, non-clogging type. Louvers are 1-in. surface hardwood. Basins are leakproof steel pan type (up to and including 10 ft. 6 in. by 10 ft. size) with redwood sideboards through-bolted to the basin sills.

All parts of the tower are factory precision cut and drilled, requiring no special skills for quick, easy installation. The towers come complete with all necessary accessories such as float-make-up valves, suction screen and overflow. There are no "extras" to purchase. Complete installation and maintenance instructions are furnished with the unit. The thermal capacity of each tower is guaranteed for the life of the structure.

For prices, discounts, and the descriptive "Cotospray" Bulletin 5.9.083 write to Equipment Division, J. F. Pritchard & Co., 908 Grand Ave., Kansas City, Missouri.

New Inland Waterway Port

The inland waterways of the United States have a new port—Harlingen, Texas. A barge shipment of 500 tons of steel from Pittsburgh, Pa., 2523 miles from Harlingen by inland waterway, officially opened the new port. The Port of Harlingen was created by the opening of a tidewater channel from the Gulf Intracoastal Waterway. The channel is 25 miles long, 125 feet wide at the bottom and 12 feet deep. The Barge canal follows the channel of the Arroyo Colorado. A turning basin 600 by 400 feet has been excavated at the port end of the channel. One dock and warehouse are now in operation and an oil dock, second warehouse and wharf are under construction. Four barge lines now serve the port. Port director is Hugh Ramsey. Members of the navigation board are Clifford Purdy, chairman, E. C. Breedlove, secretary and C. O. Bennett.

Inland River Reports

By DAVID I. DAY

THE FIRST BOAT up the Mississippi as far as Keokuk, Iowa, the navigation season of 1952 was the *Alice Ingram* with a two-barge integrated tow for the Bettendorf oil terminal, arriving on March 4. This boat came out new in 1950 at the yards of Nashville Bridge Co. The boat is 78x22.6x8.5 and has General Motors engines to two propellers. She is rated at about 1,000 hp.

THE MUCH-PUBLICIZED *M. V. Billy Potts, Jr.*, has come from the yards of the Hillman Barge & Construction Co., Brownsville, Pa., and is ready for work as a ferry pusher and light towing. The boat is owned by Capt. W. F. Potts, Sardis, O., and has twin GM units, totaling 330 hp.

TO COME UP the Mississippi and Ohio shortly from the Ingalls Shipbuilding Corporation at Pascagoula, Miss., will be the *M. V. James E. Lose*, for coal towing service on the Monongahela River. The owner will be the United States Steel Company and her arrival will be another step away from steam in the direction of dieselization. The old steamer of the same name, built at Ambridge in 1922, will long be remembered as a good towboat of her day and type. The new *James E. Lose* will have 1200 hp. from twin Fairbanks-Morse diesels.

IN ADDITION to the new *James E. Lose*, a number of new diesel vessels will be at work on the rivers this spring. There will be the *Sinclair Chicago* from the Harrisburg Machine Works, Houston, Tex., 126 x 26, with a depth of 15 feet. Owned by the Sinclair Refining Co., the boat will have twin American Locomotive diesels, totalling 1900 hp. The *Barry Dean* from St. Louis Ship will be at work soon for the Rose Barge Lines on the Illinois River. She has a 400-hp. Caterpillar engine.

THE TOWBOAT *Bullfrog* is now owned by the Powhatan Coal Company, Powhatan, O., the transfer being from the Lea River Lines. The boat will probably receive a new name. The boat is 76x24x6 and has triple Superior engines with 960 hp. total.

WE NOTED the arrival at Pittsburgh of the new 640 hp. towboat *Chartiers* for the Corps of Engineers. The boat is 96x26, has two smoothly working Caterpillars, installed by the builders, Arnold V. Walker Shipyard, Pascagoula, Miss.

AT WORK is the new *R. L. Ireland* from Dravo, owned by the Pittsburgh Consolidated Coal Co., with 1066 hp. from twin Superiors. She looks in the river like one of triplets—the other boats being the *Mathies* and the *Arkwright*.

THE FIRST TOWBOAT with a pay load above the Iowa oil terminals on the upper Mississippi this spring was the *LaCrosse Socony* of the Socony-Vacuum fleet, pushing over 2½ million gallons of gasoline and fuel oil at LaCrosse, Wis. The boat

in charge of Capt. Ivan Hansel came all the way with the twin General Motors diesel engines running smoothly.

FOR THE FIRST TIME, your correspondent saw the *William Clark* of the Commercial Petroleum & Transport Co., Houston, Texas, at work on the Tennessee River away down near the old Shiloh battlefield. The boat pushed military vehicles to Guntersville, Ala. The *Clark* was built at St. Louis Shipyards and has a 1700 hp. Enterprise engine.

ATTRACTING more attention this spring on the Mississippi than any other boat is the fine one recently started to work for Cornelius Kroll &

Company, Houston, built by the Bludworth Shipyard at Houston. She is the *Suffolk* in the oil trade and destined to become increasingly popular this summer. She is an 1800 hp. pusher, using General Motors diesel engines.

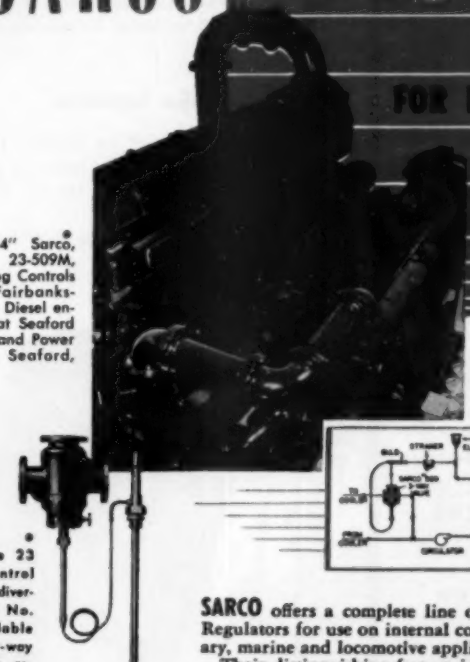
MUCH COMMENT has been made recently on the 1951 performance of the veteran *Charles W. Snider* of the Pure Oil fleet. Built at the Sturgeon Bay, Wis., shipyards ten years ago, this vessel is truly one of the pioneers which made all but universal the use of diesels on the inland waterways today. The *Snider* is 114 x 30 x 7, has Cooper-Bessemer engines, totaling 1575 hp. She was one of the last boats last season to take oil up through the freezing channel to Minneapolis.

SARCO

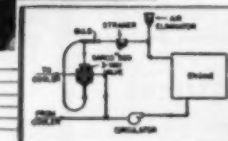
cooling controls

FOR DIESEL ENGINE JACKET WATER & OIL COOLERS...


Two 4" Sarco, type 23-509M, Cooling Controls on Fairbanks-Morse Diesel engine at Seaford Light and Power Co., Seaford, Del.




Sarco type 23 Cooling Control with 3-way diversion valve No. 509M. Available also with 2-way piston valves, reverse or direct acting (by-pass control), in sizes 1/2" to 6".



Hook-up for engine jacket control using Sarco type 23 regulator with 3-way valve to recirculate a varying portion of the cooling water.



Sarco type 13W Air Eliminators prevent air pockets in water lines.



Sarco Pipe Line Strainer.

SARCO offers a complete line of self-operated Temperature Regulators for use on internal combustion engines for stationary, marine and locomotive application. Their distinguishing feature is the use of

Liquid Expansion Thermostatic Systems . . .

In these systems, the thermostat bulb, connecting tubing and valve-closing element are completely filled with mineral oil. Expansion of this oil, when heated, pushes forward a plunger in contact with the valve discs, thus positioning the valve. Since the valves are double-seated and fully balanced, they can float on the line, providing gently throttling control. The power for moving the valve is uniform per degree temperature rise at any point of the scale. Sarco regulators are not limited to standard ranges. Each regulator is factory set for the exact operating temperature desired. It can then be adjusted by the user both higher and lower as required. Sarco controls are built with packless seals eliminating the necessity of replacing packing from time to time. Write for Sales Sheet No. S1429.

SARCO COMPANY, INC.
 EMPIRE STATE BUILDING, NEW YORK 1, N. Y.
 SARCO CANADA LTD., TORONTO 8, ONTARIO
 REPRESENTED IN PRINCIPAL CITIES

343

NICAD

MADE IN U.S.A.

TAKE ADVANTAGE OF LONG-LIFE, LOW MAINTENANCE NICKEL CADMIUM BATTERIES

for your

1. ENGINE STARTING
2. EMERGENCY LIGHTING
3. GENERAL ALARM, RADIO, ETC.



The above compact 32-volt, 204 A.H. NICAD installation, on a leading oil company barge, is replacing three 32-volt lead acid batteries that previously operated two oil pumping engines and the ship's lighting and electrical system. At least 20 hours of charging time is saved every week. Since installation of NICAD, additional electrical units have been added to ship's equipment without overload.

INVESTIGATE NICAD

Replace your lead acid batteries without altering battery boxes. Use standard charging equipment. Look into the many cost and time-saving features of NICAD. Its long life and rugged construction will protect you against materials shortages and critical man power.

NICAD FEATURES



- Exceptionally Long Life
- Negligible Water Consumption
- Eliminates Gravity Records
- Uses Standard Charging Equipment
- Rugged Construction
- Low Internal Resistance

Other NICAD applications in:
RAILROAD HEAVY AUTOMOTIVE
UTILITIES RAPID TRANSIT
LABORATORIES

NICAD

NICKEL CADMIUM BATTERY CORPORATION

100 Park Ave. New York 17, N. Y.

Factory—Easthampton, Mass.

Chicago Office—30 N. La Salle St.

MADE EXCLUSIVELY IN THE U.S.A.

Diesel Electrics for Brazil

Forty diesel-electric locomotives have been ordered from the International General Electric Company, Inc., for heavy freight work in Brazil. Purchased by the Central Railways of Brazil, the 107-ton locomotives will be built at the G-E Eric, Pa., Works. Each will be powered with American Locomotive Company V-12 diesel engines having a rating of 1600 horsepower. The locomotives will be used on the railway's meter-gage (39 $\frac{3}{4}$ -inch) lines. The conversion from steam to diesel-electric power will begin with the shipment of the first locomotive early in 1953 and will continue through 1954.

Another order of 48 wide-gage (63-inch) 1600-horsepower locomotives for all-purpose use was placed with the Montreal Locomotive Works, Limited, Alco's Canadian affiliate. These locomotives will be equipped with electric equipment built by General Electric. The Central Railway's wide gage lines are already equipped with 55 Alco G.E. road and switching locomotives built since 1943.

Book for Sales Engineers

"Selling To Industry" by Bernard Lester. 255 pages. Published by The Industrial Press, 148 Lafayette Street, New York 13, N.Y. \$3.50.

This is a compact, pocket-size book that has been

written as a manual of practical ideas and suggestions for the sales engineer who wants to analyze and improve his selling methods of finding, contacting, selling, and servicing industrial accounts. As the author points out in the introduction, "Selling any prospect effectively does not follow a beaten path. Prospects and salesmen differ . . . Products sold differ, and new problems in their application and use continually crop up. But success in selling is not a haphazard affair. Proper preparation and orderly enthusiastic procedure are necessary."

Mr. Lester writes from a wealth of experience as sales executive for Westinghouse Electric Corp. and lecturer on sales engineering and marketing. The book is written in the form of easy-to-read articles, which are grouped under such headings as "Prospects Are Our Market," "Successful Sales Interviews," "Sell the Prospect's Employees," "Follow The Customer's Decision," and "Getting Help From Others."

Industrial Representative

The Schneider Electric Equipment, Company, 1104 Farnum St., Omaha 8, Nebraska, has been appointed industrial representative for the Air-Maze Corporation of Cleveland to handle their industrial line of equipment to municipalities and utilities in the middle west. They will cover part of Kansas, all of Iowa, all of Nebraska, part of South Dakota and all of Minnesota.



"FIXED-READING"

PREMAX

PRESSURE INDICATOR

for DIRECT-READING
OF COMPRESSION AND
FIRING PRESSURES
OF EVERY TYPE OF DIESEL ENGINE

ONE OF THE FEATURES
Responsible for its Overwhelming
Preference by Leading Diesel
Manufacturers and Operators

Successive readings
may be taken rapidly since no
venting of the instrument is re-
quired between readings. No
closing of valves required to
change from firing pressure to
compression pressure reading.

For other features, write for
Bulletin 294

BACHARACH
INDUSTRIAL INSTRUMENT CO.
1000 BARNETT STREET • PITTSBURGH 9, PA.

ACCURATE
PRESSURE
READINGS
as high as
1700 P.S.I.

82

DIESEL PROGRESS

MAY 1

Aeroquip

YOUR BEST BUY IN FLEXIBLE HOSE LINES



FITTINGS are detachable and reusable. For on-the-spot hose line replacements cut bulk hose to required length and attach fittings. It saves time and money, and reduces inventory.

HOSE is tough, durable and fire resistant. Ideal for use with hydraulic fluids, lubricants, water, gasoline, Diesel fuel, air and many other fluids.

AEROQUIP CORPORATION
JACKSON, MICHIGAN

FLEXIBLE HOSE LINES • DETACHABLE, REUSABLE FITTINGS • SELF-SEALING COUPLINGS • BREAKAWAY COUPLINGS • HYDRAULISCOPE

Aeroquip Products are fully protected by Patents in U.S.A. and Aboard

These Diesel Lubricating Pumps



Nos. 53 & 55
ROTARY GEARED PUMPS
with Helical Gears
and Roller Bearings

... "grow old GRACEFULLY"

HERE ARE exceptionally long-lived, efficient pumps for your diesel's pressure lubricating system up to 200 p.s.i. Nos. 53 & 55 Brown & Sharpe Rotary Geared Pumps have very accurate helical gears and roller bearings . . . provide smooth flow at high speeds. Leakage is prevented by mechanical seal . . . no glands to wear out. Their long, trouble-free performance is proved in thousands of diesel installations. Available with capacities from 4 to 34.1 g.p.m. at 0 lbs. pressure. Write for complete Pump Catalog. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

WE URGE BUYING THROUGH THE DISTRIBUTOR

BROWN & SHARPE IBS

SLUDGE STRANGLING YOUR ENGINE?



PROTECT YOUR ENGINE AGAINST SLUDGE with

THE wixkuler
REG. U.S. PAT. OFF.

FRESH WATER ENGINE COOLING!


Easily installed inside the craft for longer engine life.



THE wixkuler **Wix Galley Mail**
WIX Cooler Co.

2900 Westlake North Seattle 9, Wash.

Sweeney POWERENCH TOOLS



for diesel engine maintenance

SWEENEY RIDGE GRINDER removes the ridge in less than three minutes from chrome or cast iron cylinder liners... Grinds true to worn contour of liner. Fits 7 1/8" to 16" I. D. cylinder liners.

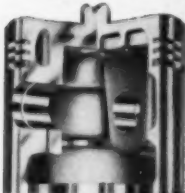
SD3 Send me information on complete line of Sweeney POWERENCH Tools.

Name _____
Address _____
City _____ State _____

B. K. SWEENEY MFG. CO., DENVER 17, COLO.

"CUSTOM-BUILT" TO FIT YOUR ENGINE

High Precision Engineered From
ALCOA VIRGIN ALUMINUM ALLOY



Close-grained, high-strength castings made to your specifications by metallurgical experts and shipped within one week.

A set for one engine or quantity-produced for engine manufacturers. Economy with no sacrifice in quality.

Write for information and prices now.

BILL JAHNS ENGINEERING CO.
649 West 17 Street Costa Mesa, California

Guth Rebuilt Diesel Castings save you money

WRITE FOR DEALERSHIP INFORMATION

GUTH COMPANY
McPHERSON, KANSAS

SERVING THE NATION FROM IT'S CENTER

NEW PETROMETER

FOR ALL TANKS
FOR ALL LIQUIDS
FOR ALL DEPTHS
FOR ALL DISTANCES

PETROMETER CORPORATION
5 STAR SQUARE LONG ISLAND CITY 1, N.Y.

GM 567 INJECTORS
60 NEW UNIT INJECTORS
AT A TREMENDOUS SAVING
HANCOCK MACHINE CO.
FINDLAY, OHIO

Specify **ADECO**
FUEL INJECTION EQUIPMENT
for dependable performance!

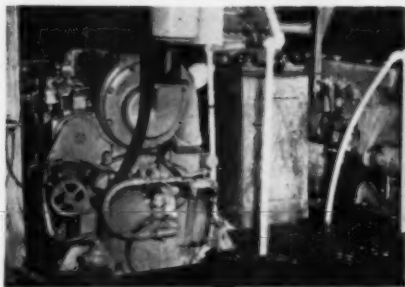
ADECO PRODUCTS, INCORPORATED
Chicago 40, Illinois

MASTER CRAFTSMEN OF FINE FUEL INJECTION EQUIPMENT

DIESELS REJUVENATE LIGHTER



The 50-year-old, recently dieselized lighter *Atlantic* and her two Model 6-110 GM diesels which give the craft a speed of 8 knots.



ALTHOUGH the 50-year-old self-propelled lighter *Atlantic* may show exterior signs of long and strenuous service in New York Harbor she is as efficient today as any ship just off the ways. Her old steam machinery has been replaced by diesel engines which now provide power not only for propulsion but for hoisting, pumping and the generation of electric current. According to her owners, the Peterson Lighterage and Towing Corporation of New York City, the 100-foot craft, despite her age, can now hold up her head with the best of them in turning out a good day's work. The company reports a 50% increase in daily tonnage moved due to the craft's greater maneuverability and the faster action of her 97-ft. boom.

She is propelled at a cruising speed of eight knots

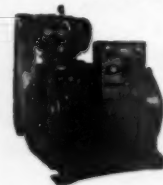
by two General Motors model 6-110 diesel engines swinging twin 58-in. x 32-in. propellers. A four drum hoist with a lifting capacity of eight tons is powered by a GM 4-cylinder diesel engine of the "71" Series. Current for lights, electrical steering and other accessories is provided by a small generator powered by a 2-cylinder GM. A fire and wrecking pump is driven by a front power take-off on her starboard propulsion engine. The ship is used to transport automobiles and trucks boxed for export to ships outside the harbor.

Completely Dieselized

By the end of this month, all motive equipment on the New Haven Railroad will be completely diesel-electric with steam power a relic of the past. The thousands of Boston commuters who used to move through clouds of steam in the South Station will no longer suffer this annoyance. Gone will be both the steam clouds and the coal gas fumes. The New Haven Railroad will have a total of 378 units with the delivery of the last 23 due this month. These engines replace a total of 1,275 steamers which the road once operated.

A.C. anywhere with KATOLIGHT generators

Builders of A.C. Generators from 350 Watts to 300 K.W.



Larger sizes available in speeds of 720, 900, 1200, 1800 RPM at 60 cycles. Can be furnished as illustrated, complete in every way. Many sizes available with direct connected exciter. Odd frequencies from 25 to 400 cycles are our specialty, available in many sizes.

Manufacturers of Electrical Machinery Since 1928

KATO ENGINEERING CO.
1443 First Avenue • Mankato, Minnesota

Kato Issues Catalog Folder

The Kato Engineering Company has issued a new catalog folder, fully illustrated and easily read. It gives complete specifications on their ac. generators, motor-generators, dc. to ac. converters and ac-dc. power plants. Compiled for quick reference, the specification tables for each of the units are simple to read for all of the indicated applications and power requirements. Nationally known engines are used on the larger units that require two or more cylinders. Generators of odd frequencies and voltages are a specialty of this organization. The bulletin is a valuable addition to the files of any potential user of this equipment. It is obtainable by writing the Kato Engineering Company, Mankato, Minnesota.

Indicating Pyrometer Controller

A compact, direct reading, indicating pyrometer controller incorporating a built-in unit to provide straight-line control is being offered by Wheelco Instruments Company, Chicago. The new Model 293 Capacitrol now presents a means of securing a type of proportioning control for processing equipment such as ovens, furnaces, kilns, pots, vats and plastic molding machines, heretofore only obtainable through the use of auxiliary devices or complicated equipment. The instrument operates with the same Wheelco "Electronic Link" incorporated in the company's established line of Capacitrol controllers, but adds the new Line-otrol feature to automatically reduce to a minimum the

"on" and "off" variation of the control instrument above and below the preset control point. Thus a hair-line control of the process variable (temperature, etc.) is achieved.

This is an economical on-off type controller using the same measuring system with Alnico V Magnet and control assembly utilized in its predecessor Model 292, but with the further advantage of being able to compensate for the transfer lags inherent in all heat processing or process control systems. Size of the instrument is 7 1/4 in. wide x 8 1/2 in. high x 7 25/32 in. deep, making it ideal for space saving, flush or surface mounting on original heating equipment or instrument panels. A wide range of standard scales in various thermocouple calibrations are available. Capacitrol features such as thermocouple break protection, interchangeable voltage electro plugs, front accessibility, and plug-in terminal panel have been retained in the new Model 293.

Canadian Distributorship

Hewitt Equipment Limited, Montreal, has been formed to serve as a new Caterpillar distributorship for the Province of Quebec with the exception of the Magdalen Islands, it is announced by Caterpillar Tractor Co. A branch store will be operated at Quebec City. Robert Hewitt, until recently a vice president and director of Geo. W. Crothers Limited, Caterpillar distributor in Ontario, is president of the new organization.

REDUCE YOUR ATOMIZER REPAIR BILL BY 95%

In 5 minutes



recondition

**FUEL INJECTOR NOZZLES
AND NEEDLES!**

**MERLIN
SERVICEMASTER**

Machines will do this work to manufacturers' original standards and reduce your atomizer repair bills by 95%. The Merlin Servicemaster will grind a point dead concentric with another portion and retain a predetermined angle to within a minute of a degree. It is the first and only machine for these operations. Designed for use in your own shop! Full details from Dept. DP.



Concessionaires
in the
U.S.A.
required.



Sole Manufacturers
and Patentees

THE MERLIN ENGINEERING CO. LTD. - Hebble Mills, Salterhebble, Halifax, England



TEMPERATURE REGULATOR

For Jacket Water and Lube Oil Control

Unsurpassed for reliability and power to operate large or small size 3-way or 2-way diaphragm valves for accurate control of jacket water and lube oil cooling temperatures.

IMPORTANT ADVANTAGES

- Adjustable Sensitivity and over-heat protection.
- Calibrated Dial temperature adjustment.
- Simple, Rugged Construction withstands vibration and insures many years of reliable service.
- Temperature Ranges 50 to 250° F. and 150 to 350° F.
- Easy to Install Requires 15 lb. supply of compressed air or water for its operation.
- Small Size—regulator head is only 2 1/4" x 3 1/4", sensitive bulb is 12" long with 1/4" I.P.S. connection.

Write for Bulletin 316

Powers FLOWRITE Valve
controlled by a Powers ACCRITEM Regulator
makes an unbeatable combination for better
control and — Less Maintenance



You will get

**TOP Performance with
this Better Valve Top.**

Durable moulded neoprene diaphragm (1) has positive sealing head which provides increased sealing action with increasing control pressure. Efficient diaphragm form insures ample and constant operating power thru full travel. Piston Plate Assembly (2) has a free floating thrust plate which absorbs side thrust. Closely guided piston plate maintains stem in accurate alignment. (all)

Gives Better Control

**and Many
Years of
Dependable
Service**

THE POWERS REGULATOR CO.

3411 Oakton Street, SKOKIE, ILL. • Offices in over 50 Cities
60 YEARS OF WATER TEMPERATURE CONTROL

**FOR
COMPLETE
PURIFICATION
OF USED OIL**

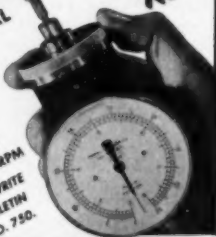
The Hoffman Oil Conditioner saves lube oil by removing solubles and insolubles—saves centrifuge maintenance costs. Capacities of 50 to 800 g.p.h. Write for Bulletin A-687 and A-688.

U. S. HOFFMAN
MACHINERY CORPORATION
FILTRATION DIVISION, 212 LAMSON ST., SYRACUSE 6, N. Y.

**BEST for
DIESELS!**

How are
your
Revs?

STICHT UNIVERSAL
HAND
TACHOMETERS
CENTRIFUGAL TYPE
5 RANGES IN
ONE INSTRUMENT
CATLO. 303-30-12,000 RPM
FOR DETAILS WRITE
FOR BULLETIN
NO. 750.



HERMAN H. STICHT CO., INC.
27 PARK PLACE NEW YORK 7, N. Y.

For...

**CLEAN ENGINES
LOW FUEL COST**

and

**Trouble-Free Operation
use**

**SINCLAIR
GASCON® OIL HD**

Sinclair Refining Company
600 Fifth Avenue, New York, N.Y.



PORUS-KROME and VANDERLOY M
Renew All Cylinders and Crankshafts
to BETTER-THAN- NEW Condition

VAN DER HORST CORPORATION OF AMERICA • OLEAN, N. Y.
U. S. PATENTS 2,048,576, 2,314,684 and 2,412,690

PORUS - KROME VANDERLOY
Good for the life of your engine

West Coast Diesel News

By FRED M. BURT

TO POWER "Voice of America" radio transmitter on converted C-1, now under test in the Caribbean, three 500 kw. General Electric generators powered by DSG-36 (695 max. hp.) Enterprise diesel engines; cooling system is Vapor Phase unit producing low pressure steam (15-psi) which goes into Graham sea water evaporator to produce 4600 gal. fresh water daily.

MAKING IT his fourth Cummins diesel-powered truck, Raph Pitkin, produce hauled of El Centro, Calif., has re-powered his WB-28 White truck with a 200-hp. Cummins (previously gasoline engine powered).

A 6-CYLINDER 175-hp. Caterpillar diesel with Twin Disc converter from Shepherd Tractor & Equipment Co., Los Angeles, purchased by Hathaway Co., Santa Fe Springs, to power portable oil well drilling outfit.

PURCHASED BY Orinoco Mining Co., to transport iron ore in Venezuela, nine 1600-hp., 180-ton, road-switcher type, Baldwin-Lima-Hamilton diesel electric locomotives; also a 250-ton diesel wrecking crane from Industrial Brownhoist Corp.

RECENTLY acquired by Washington State College, a new 3-cyl., 4-cycle Enterprise "M" engine, 68-120 hp. equipped with all the modern accessories, to be used in teaching students the fine points of diesel design, development, maintenance and operation.

PURCHASED BY Chas. Davies, Los Angeles contractor, to power a rock-crushing plant on highway construction job, a 165-hp. Murphy industrial diesel engine, from Engine Sales & Service, Los Angeles.

THE NEW 127-ft. tuna clipper *Sea Preme* built by National Steel & Shipbuilding, San Diego, designed by Wm. P. Trammel, naval architect, is powered with a DMG-38, 8-cyl. Enterprise diesel (925 max. hp.) with two 133-kw. Murphy diesel electric sets for auxiliaries.

FOR BERG METALS CO., Los Angeles, three 35-hp. Caterpillar diesels to power generators for magnet current on three Brownhoist cranes used to handle scrap metal. (These cranes previously converted from steam power, using 105-hp. "Cat" diesels with Twin Disc Torque Converters.)

THE NEW 54-ft. troller *San Martin* from Alf Hansen's Boatshop, Seattle, owner "Nash" Martin, has for main power a 132-hp. Cummins diesel driving through 3:1 Twin Disc clutch transmission.

WANTED G. M. "71"

Discarded injector ports & assemblies, 10 to 1000

INCORP, 7120 Carnegie, Cleveland, Ohio

**NEED A TRAINED
DIESEL
TRACTOR AND HEAVY
EQUIPMENT MAN?**

We have lists of trained Diesel, Tractor, and Heavy Equipment operators, service men, and mechanics available for employment throughout the country. If you have need of such a man we will be glad to furnish complete information without obligation to you. Write to

PLACEMENT DEPARTMENT
INTERSTATE TRAINING SERVICE
PORTLAND 13, OREGON

**SALES ENGINEER
REQUIRED**

To maintain technical and sales contacts with engineering and purchasing departments of operating railroads; prefer man under 35 with degree in Mechanical Engineering plus previous experience with Railroad Diesel locomotives. Previous customer contact experience essential.

To the man who meets the requirements, this presents opportunity to become associated with AAA-1, 10-year-old, growing Mid-Western company, salary, bonus, and expenses plus profit-sharing plan.

Write Box 503, outlining experience and qualifications, DIESEL PROGRESS, 816 N. La Cienega Blvd., Los Angeles 46, Calif.

MURPHY DIESELS

New and used, 90 hp. to 220 hp., generators 60 kw. to 133 kw., diesel or dual fuel engines. INDUSTRIAL ENGINE SERVICE, 5315 Valley Blvd., Los Angeles, Calif. Phone: Capitol 6176.

AVAILABLE

Sales Engineer with successful background as Eastern Sales Representative also Consulting Engineer and Branch Manager diesel engine sales. Seeking sales position at Branch Management level. Address: Box 501, DIESEL PROGRESS, 816 N. La Cienega Blvd., Los Angeles 46, California.

**DURA-BOND'S
"FACTS ILLUSTRATED"**

All Round camshaft bearings vs. split and interlock types

SEND FOR FREE COPY

Conclusive proof that "all round" cam bearings are more profitable, give superior performance than split and interlock types. Mail coupon today.

DURA-BOND ENGINE PARTS CO.
725 Loma Verde Ave., Palo Alto, California
Send me "Facts Illustrated" and your cam bearing catalog.

Name.....
Street.....
City..... State.....

STOP SPILLS

during tank fills



with
VENTALARM®
TANK FILL SIGNAL

"Fill 'til the
Whistle Stops"

Over 4,000,000
VENTALARM Signals now
in operation on home, auto-
motive and diesel tanks.

VENTALARM
WHISTLING TANK FILL SIGNAL

Descriptive literature sent on request.
SCULLY SIGNAL COMPANY
82 First Street, Cambridge 41, Mass.

NEW ENGINE COOLER CUTS COOLING COSTS

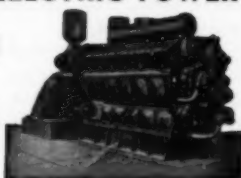
Trane Dry Type Fluid Coolers cool lube oil, cool jacket water, with less power, less maintenance. Rugged, efficient units for practically any engine cooling job. Write for data.

THE TRANE COMPANY
LA CROSSE, WISCONSIN

DIESEL ELECTRIC POWER

for
**IMMEDIATE
SHIPMENT**

Unit Capacities
10 to 1875 Kva
A.C. 50-60
Cycles
Various
Voltages



Write or wire today for bulletins and complete information regarding these fine fully guaranteed, low cost **DIESEL ENGINE GENERATING UNITS**. Visit our plants at Sausalito (S. F.), California, and Jersey City, N. J., and see units in operation on our test stand.

"SPECIALISTS IN DIESEL POWER"

A. G. Schoonmaker Co., Inc.
54 Church St., New York 7, N. Y.



SPICA

S.P.A.

LIVORNO, ITALY

- Fuel Injection Pumps
- Nozzles - Plungers
- Valves - Feed Pumps

SOLE SALES AGENCY **R.I.M.S.A. S.P.A.**
VIA CIMAROSA 9A MILANO (ITALY)

FOR EMERGENCY POWER at the new Southern California and Southern Counties Gas Companies' booster station at Desert Center, Calif., two 6-cy. 180-hp. natural gas engines (purchased from Buda Engine & Equip. Co., Los Angeles) direct-connected to 60-kw. ac. Fairbanks-Morse generators.

W. J. GILLIS' 65-ft. sports fishing boat *Spitfire*, Pierpont Landing, Long Beach, along with being completely rebuilt and outfitted, has been re-powered with two 300-hp. supercharged Cummins diesel engines, supplied by Cummins Service & Sales, Los Angeles.

THE SEINER *Cape Ray* from Sterling Shipyards, Vancouver, B. C., for Canadian Fishing Co., is powered with a D1300, 120-hp. Caterpillar diesel, with 3:1 Twin Disc clutch reduction gear.

TO PROVIDE electricity for pumping power for Continental Oil Co., Sussex, Wyo., three new 400-hp. Worthington natural gas engines drive 300-kw. Electric Machinery generators; one Engineering Controls' Vapor Phase system turns jacket water heat into low pressure steam to provide ample heat for power plant building in sub-zero weather; in summer automatic change-over discharges heat out through roof.

TO PROVIDE power for iron ore crushing at Fred Hedstrom's Iron Age mine, 29 Palms, Calif., a 217-hp. Hercules diesel.

NEW FANTAIL fishing boat, 37½-ft. *Jimmy Boy*, owner Frank Iacono, San Pedro, built by John Tassio, is powered with a 3-cy., 100-hp. General Motors diesel engine and with 3:1 hydraulic reduction gears.

FROM SHORE LINE Diesel Maintenance Co., San Francisco, to repower Sebastiano Aliotti's combination boat *Tonia A*, a new GM, 3-cyl. diesel engine with 2:1 Twin Disc clutch and reverse gear.

Purchased by California Blacksmithing and Welding Shop, Inc., Los Angeles, a 50-hp. Buda diesel to power a California Earth Borer machine that can drill holes 10 in. to 72 in. diameter and to 200 ft. deep, with attachments.

FROM Engine Sales and Service, Los Angeles, three Murphy 100-kw. diesel-generating sets for Molybdenum Corp. at their Mountain Pass, Calif., mining development operation to obtain a rare earth which provides a special material for steel processing; the only other known similar deposit is in Brazil.

THE NEW TUG *Joan Lindsay* recently under trial in Vancouver, B.C., is now engaged at towing barges from Vancouver Island to the mainland with power supplied from its Union Model P-6 diesel marine engine.

Standard for Diesels

**PIERCE
GOVERNORS**

assure maximum
performance and
protection

Pierce-Centrifugal
Governors give exact
control of engine RPM
to meet the varying
conditions of any job.
Engine protection is
guaranteed.



PIERCE governors engineered specifically for Diesels assure long, trouble-free operation . . . usually for the life of the engine. Many Diesels feature PIERCE as standard equipment to assure maximum protection, better performance and less maintenance.

PIERCE replacement governors to fit most engines are available through your local distributor.

For your distributor's name or for specific information on new engine design or special governing problems, write or call Sales Department, Pierce Governor, 1623 Ohio Ave., Box 1,000, Anderson, Indiana.

PIERCE GOVERNORS

"FIRST NAME IN GOVERNORS"



Throughout the
Power Industry—

**Aerofin Fin-Type
Heat-Transfer
Units do the job
Better, Faster,
Cheaper.....**

**AEROFIN
CORPORATION**
410 Tenth Street, St. Petersburg, Fla.

PHOTOVOLT Photoelectric Crankcase Oil Tester



for measurement of darkness of crankcase oil as an indication of its degree of contamination by carbon and other foreign particles. Write for Bulletin #750 to

PHOTOVOLT CORP.

95 Madison Ave.

New York 16, N.Y.

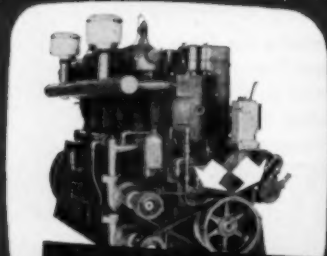


COLUMBIA GENERATORS A. C. and D. C.

Columbia, with its years of experience, brings to you a wide line of performance proved, sturdily built, A.C. and D.C. Generators. A.C. Generators: 6 1/4 to 1000 KVA. D.C. Generators and Exciters: 2 to 300 KW. Available in Single or Two Bearing Construction. Write today for information. Our engineers will be glad to review your requirements. Prompt delivery.

COLUMBIA ELECTRIC MFG. CO.
4519 Hamilton Ave., Cleveland 14, Ohio

For POSITIVE LUBRICATION



TUTHILL Positive Displacement PUMPS

There's no place for guesswork in the lubrication of diesel engines and power units. Tuthill pumps provide a positive method of lubricating and scavenging. Dependable, economical automatic reversing pumps and stripped models for incorporating directly into the design of your engine are available to meet any lubrication requirement. Send your specifications for recommendation on the Tuthill pumps best suited to your needs.



TUTHILL PUMP COMPANY
939 E. 95th Street, Chicago 19, Illinois

ADVERTISERS' INDEX

| | | | |
|---|--------------|--|----------------|
| Adeco Products, Inc..... | 84 | Interstate Diesel Service, Inc..... | 86 |
| Aerofin Corporation..... | 87 | Interstate Training Service..... | 86 |
| Aeroquip Corporation..... | 83 | Bill Jahns Engineering Co..... | 84 |
| American Air Filter Co., Inc..... | 20 | Kato Engineering Co..... | 84 |
| American Locomotive Co..... | 19 | Korfund Company, Inc., The..... | 80 |
| Ashland Oil & Refining Co..... | 8 | Lanova Corporation..... | 79 |
| Bacharach Industrial Instrument Co..... | 82 | Marquette Metal Products Co., Inc..... | 22 |
| Baldwin-Lima-Hamilton Corp..... | 25 | Merlin Engineering Co., Ltd., The..... | 85 |
| Binks Manufacturing Co..... | 24 | Mid-Continent Petroleum Corp..... | 70 |
| Briggs Filtration Co., The..... | 57 | Murray & Tregurtha, Inc..... | 69 |
| Brown & Sharpe Mfg. Co..... | 83 | Nickel Cadmium Battery Corp..... | 82 |
| Buffalo Forge Company..... | 62 | Nordberg Mfg. Co..... | 59 |
| Burgess-Manning Company..... | 2 | Nugent & Co., Wm. W..... | 63 |
| C.A.V. Ltd..... | 68 | Petrometer Corp..... | 84 |
| Cities Service Oil Co..... | 26 | Photovolt Corp..... | 87 |
| Cleveland Diesel Eng. Div., General Motors Corp..... | 5 | Pierce Governor..... | 87 |
| Columbia Electric Mfg. Co..... | 88 | Powers Regulator Co., The..... | 85 |
| Cooper-Bessemer Corp..... | Fourth Cover | Purolator Products, Inc..... | 4 |
| Cummins Engine Co., Inc..... | 9 | Quincy Compressor Co..... | 64 |
| Detroit Diesel Engine Div., General Motors Corp..... | 6 | Read Standard Corporation..... | 65 |
| Diamond Chain Company, Inc..... | 61 | Sarco Company, Inc..... | 81 |
| Duluth Filter Co..... | 77 | Schoonmaker Co., A. G..... | 87 |
| Dura-Bond Engine Parts Co..... | 86 | Scintilla Magneto Div., Bendix Aviation Corp..... | 17 |
| Eaton Manufacturing Co..... | 78 | Scully Signal Company..... | 87 |
| Eclipse Machine Div., Bendix Aviation Corp..... | 80 | Sinclair Refining Co..... | 86 |
| Electrical Machinery Mfg. Co..... | 10 | Skinner Purifiers Div., Bendix Aviation Corp..... | 24 |
| Electro-Motive Div., General Motors Corp..... | 12 | Spica, S.P.A..... | 87 |
| Elliott Company..... | Third Cover | Standard Oil Co. (Indiana)..... | 11 |
| Enterprise Engine and Machinery Co..... | 28 | Sterling Engine Co..... | 76 |
| Erie Bolt & Nut Co..... | 73 | Sticht Co., Herman H..... | 86 |
| Erie Forge & Steel Corp..... | 18 | Sweeney Company, B. K..... | 83 |
| Flexonics Corporation..... | 71 | Synchro-Start Products, Inc..... | 24 |
| General Motors Corp., Cleveland Diesel Engine Div..... | 5 | Texas Co., The..... | Second Cover-1 |
| Detroit Diesel Engine Div..... | 6 | Thomas Flexible Coupling Co..... | 60 |
| Electro-Motive Div..... | 12 | Tide Water Associated Oil Co..... | 7 |
| Harrison Radiator Div..... | 21 | Torcon Corporation..... | 66-67 |
| Gulf Oil Corp..... | 13 | Trane Company, The..... | 87 |
| Guth Company..... | 84 | Tuthill Pump Company..... | 88 |
| Hancock Machine Co..... | 84 | Union Diesel Engine Co..... | 72 |
| Harrison Radiator Div., General Motors Corp..... | 21 | United States Hoffman Machinery Corp..... | 86 |
| Hilliard Corporation, The..... | 55 | Van Der Horst Corp. of America..... | 86 |
| Honan-Crane Corp..... | 74 | Westinghouse Electric Corp..... | 23 |
| Illinois Testing Laboratories, Inc..... | 75 | Wix Cooler Co..... | 83 |
| Industrial Engine Service..... | 86 | Young Radiator Co..... | 15 |
| International Harvester Co..... | 3 | | |

ELLIOTT DIESEL-DRIVEN GENERATORS

are serving all over the map!



Literally thousands of Elliott generators are quietly reeling off the kilowatts, serving in every state of the Union. Types include direct-current, alternating current, horizontal and vertical generators. Elliott "Fabri-Steel" construction used in all present-day Elliott generators, not only provides exceptional rigidity and crack-proof strength, but also facilitates custom-built design to the precise requirements of the individual installation.



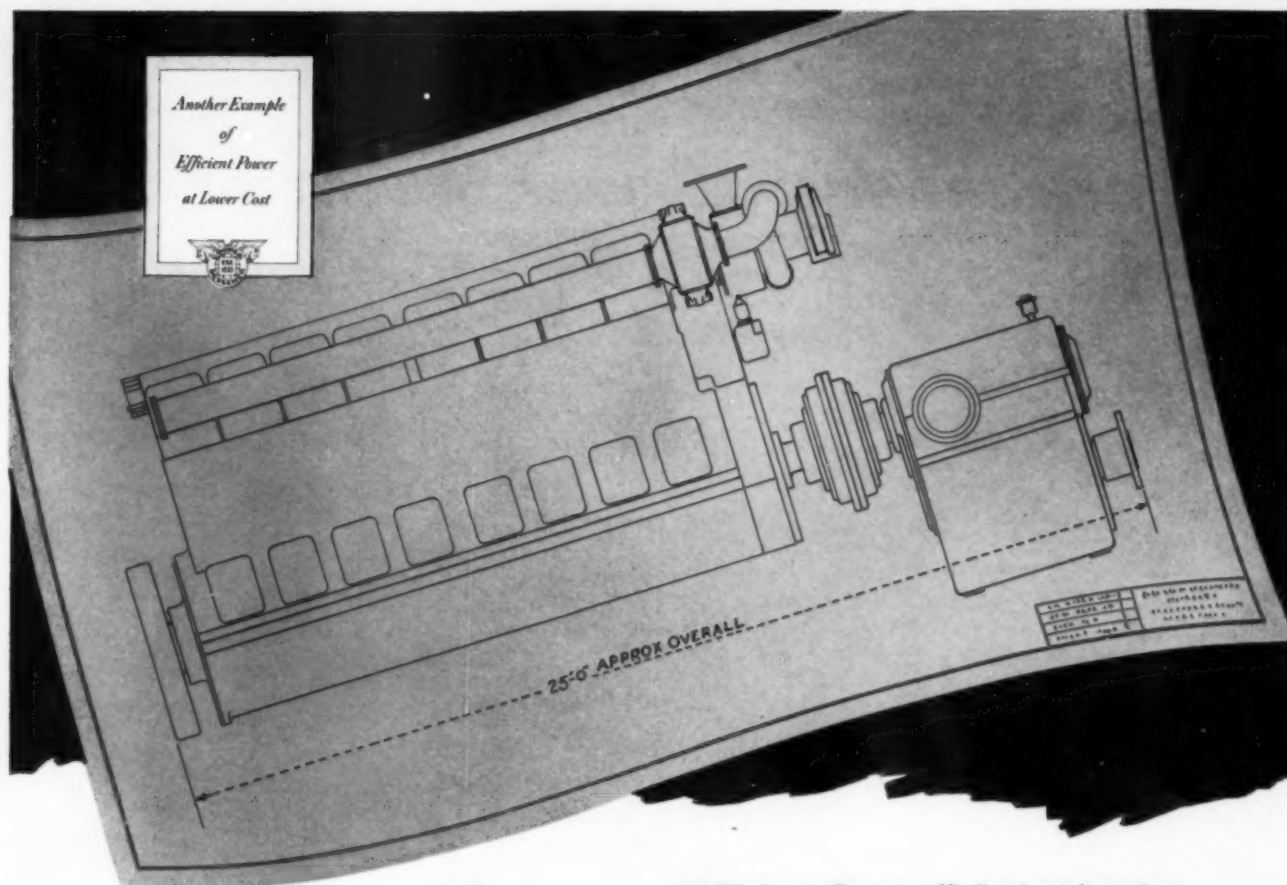
ELLIOTT Company

**Ridgway Division
RIDGWAY, PA.**

Plants at: JEANNETTE, PA. • RIDGWAY, PA.
AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES



Another Example
of
Efficient Power
at Lower Cost



Now...
Cooper-Bessemer offers
1,450 horsepower
JS DIESEL PACKAGE
with aftercooling*
and gears

* Aftercooling water-cools the air between supercharger and intake manifold, thereby permitting more air for greater power.

THE Cooper-Bessemer JS diesel needs no introduction. It certainly has proved itself to be the outstanding engine in workboat service today.

Now, the supercharged JS is ready to do a bigger and better job than ever. With Cooper-Bessemer aftercooling and reduction gear, the JS is rated 1,450 hp — a conservative rating with the usual provision for overload.

It adds up to this . . . a 50% increase in power with conservative engine speed and ideal wheel speed — delivered by an engine that has proved itself to have no equal in workboat service.

The nearest Cooper-Bessemer office will gladly give you complete details.

The
Cooper-Bessemer
Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York, N. Y. Washington, D. C. Gloucester, Mass. San Francisco, Calif.
Houston, Texas Seattle, Wash. Los Angeles, Calif. Chicago, Illinois
St. Louis, Mo. Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia
San Diego, Calif. New Orleans, Louisiana